SUBMISSION

from

Cooperative Research Centres Association

to the

INQUIRY INTO PRIMARY PRODUCER ACCESS TO GENE TECHNOLOGY

by the

House of Representatives Standing Committee on Primary Industries and Regional Services

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Contents:

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1. Purpose of the Submission from the Cooperative Research Centres Association:

To provide comment on the key areas designated from the perspective of Cooperative Research Centres working in the Agricultural and Rural Based Manufacturing Sector particularly from the perspective of crops.

2. What is the Cooperative Research Centres Association (CRCA)?

The CRC Association comprises 53 member Cooperative Research Centres of those currently operating. Some are still in the process of joining for the new membership year and the new CRCs successful in the recent application round for funding are not yet operational. The CRCs cover the industry sectors of manufacturing, information & communication technology, mining & energy, agriculture & rural based manufacturing, the environment and medical science & technology.

The CRCA:

- represents members' views on issues of generic importance to CRCs and their operation
- allows members to share experience and practices as given the diversity of CRCs, some one has often "done it before"
- helps to promote awareness of CRCs and the CRC Program.

The CRCA organizes a range of activites, the key one of which is the flagship event, the Annual CRC Conference. This provides an opportunity to showcase the achievements of CRCs to a wider influential audience and to allow CRCs to share experiences in business, communications and education activities. The most recent Conference in April this year focused on the use and uptake of research and the theme was, appropriately, “Reaping the Rewards of Research”. As part of this the Association instigated the Awards for Excellence in Technology Transfer where the key criteria were the demonstration of uptake by research users of the CRC technology transferred to them, the demonstration that the research outcomes enhanced competitiveness, efficiency and/or profitability for research users and the demonstration of a close relationship between the CRC research team and research-user partner which resulted in the effective application of the technology transferred.

3. What are CRCs?

CRCs are part of the CRC Program which was set up in 1990 to strengthen collaborative research links between industry, research organisations, educational institutions eg Universities and relevant government agencies eg CSIRO This is achieved by setting in place formal strategic long-term (7 year) agreements between research providers and research users in the public and private sectors. The Program is unique globally.

The Government contributes about a third of the funds; the participants the remainder. Indeed the Federal Government's total allocation to the program since its inception and running through to 2003 is $1.1 billion; over the same period, CRC core participants, comprising government agencies, research organisations and universities have committed about $2.7 billion to CRC research.

CRCs have established research alliances with more than 900 large and small-to-medium sized enterprises. Of these 120 individual large companies and 26 small-to-medium sized enterprises work with CRCs as core participants in CRCs.

The focus of CRCs is on technology transfer; this is particularly assisted by the bringing together of first class researchers with research users; this in turn leads to a quicker uptake of the outcomes of the research because the users and researchers have been "shaping the product"/ "developing the new knowledge" together from the start.

CRCs also have a strong training role and are producing more work-place oriented post-graduates. These in turn are important in technology transfer.

3.1 CRCs and biotechnology

As was noted in the statement of the Minister for Industry, Science & Tourism (August 1998), 14 of the currently operating CRCs undertake major research work involving biotechnology. This is predominately in the areas of medicine and agriculture. Funding for these Centres from the CRC Program totals more than $260 million over the lifetime of their agreements (usually 7 years). Another 15 CRCs, covering agriculture, environment, food, mining and manufacturing undertake a significant amount of biotechnological research.

4. Future value and importance of genetically modified varieties

It is anticipated that over the next 20 years genetically modified varieties will become extremely important in Australian agriculture, as they will add value for both the producer and consumer.

There will be three phases of development and implementation of genetically modified varieties.

(i) Introduction of input traits such as resistance to herbicides and pests

This is the current phase, and there are differences in the stage of implementation depending on country and crop. In Australia, "Bt cotton" has been commercialised. (Bt cotton has been modified to contain the gene from a bacterium *Bacillus thuringiensis*, which produces an insecticidal protein toxic to the key insect pest of cotton).

It is likely that genetically modified herbicide resistant canola will be available commercially in a few years. Herbicide resistant canola produced by conventional means

is grown commercially now. Herbicide resistant wheats are being developed using genes available from overseas multinational companies. At this time there are no genetically modified varieties of rice available in Australia, but work is being conducted in Australia and overseas on engineering rice.

(ii) Development of genetically modified varieties with improved quality

Improving quality of our crops will be particularly attractive to commercial companies aiming to obtain a marketing advantage. Traits that will be considered include e.g. improved starch and protein properties in wheat, feed quality in barley, manipulating enzyme activity in malting barley, changes in nutritional value and starch properties in rice, oil quality on canola, improving pasture quality.

(iii) Improvement of performance traits

In the future the capability will exist to control and manipulate traits such as yield, tolerance to drought, efficiency of nutrient uptake, and tolerance to other stresses such as excess boron or sodicity.

Biotechnology provides the opportunity to make major advances in crop improvement.

The other key feature in considering the importance of these developments is that commercial organisations see biotechnology as a means of being able to achieve returns on their substantial investment in R&D. Alliances are being established involving national and international groups throughout the whole chain, from basic research to the consumers. There will be major investments in crop development through these alliances, leading to significant improvements. If Australia is not actively involved in these developments our crops will not be competitive on international markets.

It is difficult to place an estimate on the potential value of improvements using genetically modified varieties. Assessments in USA indicate Bt transgenic cotton has reduced the use of pesticides and there have been significant benefits to cotton growers, the company developing the technology, and the consumers. Genetically modified crops have been adopted in USA much faster than any previous technology, which reflects the value farmers have placed on these new varieties. In Australia, farmers have readily accepted a herbicide tolerant canola produced by conventional means, even though it has a yield and quality penalty. Clearly farmers put a high priority and value on having an easy means of controlling weeds.

Australian farmers could not afford to ignore new quality types developed using genetic technology otherwise our industries would lose their international competitiveness. It is generally accepted that, in time, traditional varieties will not be competitive, in the same way that old varieties produced conventionally are no longer competitive.

It is likely, that small markets for non-genetically modified crops (GMO) crops will develop as it has for organic produce. However, the importance of this niche market will decline as GMO crops become widely accepted.

5. The ability of producers to compete using traditional varieties

In general, it will be difficult for traditional varieties to compete with genetically modified varieties, as discussed in the previous section. This may not be because they are genetically modified *per se*, but simply because they will have many advantages and improvements. Given the large investments required, genetically modified crops will not be developed unless they offer substantial improvements. The significance of gene technology needs to be kept in perspective. It is simply another technique that plant breeders can use to produce the next era of improvements.

The ability of producers to compete using traditional varieties can be considered more specifically by identifying whether there are benefits to the producers and/or consumers. This will depend on the relative price of transformed and traditional varieties.

There are four scenarios that can be considered.

(i) Benefits to both consumer and producer

The genetically transformed varieties are of a higher quality than the untransformed varieties, and also cheaper to produce.

In this circumstance the genetically modified varieties will rapidly dominate the market place. An example might be improved taste and resistance to berry rot in strawberries. If Australian growers cannot access the technology, then they are unlikely to be able to export competitively and may even loose the local market.

(ii) Benefits primarily to the consumer

The genetically modified variety costs the same to produce, but offers significant benefits to the consumer.

If the consumer benefits are realised, even with a higher cost of production the varieties will rapidly dominate. If the price received by growers is the same it will depend on the producer preference driven by subtle differences in farmer perception of ease of production. An example might be a product that is perceived to be more healthy due to increased levels of anti-oxidants.

(iii) Benefits primarily to the producer

The genetically modified varieties are cheaper to produce than the untransformed varieties.

Whether these will dominate the market place will depend on their price in the market place relative to untransformed varieties and the level of consumer resistance to the use of genetically modified varieties in the food chain. If most people are happy to consume genetically modified foods then a small price reduction is likely to ensure that the genetically modified varieties dominate production. If there is a high level of resistance to consuming genetically modified foods then their price will have to be considerably less than the untransformed varieties. Examples might be varieties with improved resistance to pests, diseases or herbicides.

(iv) No benefits to producer or consumer

Genetically modified crops would obviously have no impact if they cost more to produce and had a reduced value.

The outcomes in scenario 1 are clear cut, giving total dominance. In scenarios 2 and 3 the outcomes are more subtle. With increased consumer confidence in consuming genetically modified foods it is likely that genetically modified varieties will come to dominate, but more slowly than would be the case in the scenario 1. Producers of traditional varieties will then be at a disadvantage.

The most difficult situation for Australian producers would be where a piece of gene technology is available that gives our competitors a marketing edge, either by reduced production costs or increased value of the crop, but where we are excluded from using iteither because of local regulatory barriers or insurmountable intellectual property (IP) issues.

6. The commercialisation and marketing of varieties

In many species the technical barriers to the production of genetically modified crops have been solved, and an increasing suite of useful genes are becoming available.

There are some major barriers that have to be addressed when trying to commercialise genetically modified crops.

(i) Access to intellectual property

Currently the holders of core IP are not interested in “minor crops”. However, these are often of significance to Australian producers.

Currently the holders of core IP appear to be reducing competition for their core species by ensuring that access to IP is not made available to potentially competing species.

(ii) Ability to deal with regulatory issues

The regulatory environment is such that growers of many minor crops will be excluded from genetically modified varieties because the cost of dealing with regulatory issues does not make investment in these crops by large companies worthwhile.

The delays in establishing an effective national regulatory mechanism is handicapping the introduction of this technology.

(iii) Consumer acceptance.

Consumers are wary of genetically modified food because of an ill-informed debate and "scaremongering" by some minority groups. This could lead to a potential barrier to acceptance.

Although some producers recognise the benefits from genetically modified crops, the implications to their business if consumers reject the new product is so great they are not prepared to take the risk. This is the case for the malting industry.

(iv) Control of varieties

It is likely that the nature of plant breeding in Australia will change considerably over the next 5 to 10 years, with much greater commercial input. This will be partly driven by the investment in biotechnology and the desire of companies to have greater control and ownership of varieties developed using this technology. Companies will control the commercialisation and marketing of varieties to a greater extent.

While companies will be interested in being involved in breeding for the major crops, there will be less interest in the small industries in Australia. The only protection the Australian industry will have is to maintain an active variety development program to keep companies focussed. This will only be possible while technology is available to the public and semi-private breeders.

7. The cost to producers of the new varieties

Since genetically modified varieties are likely to be controlled by companies, the cost will be governed by:

- Competition in the market place
- The comparative advantage of the variety
- The capacity of the producer to pay.

There is no conceptual difference in pricing the seed of genetically modified and traditional varieties. If the seed producers place too high a price on their genetically modified varieties, then the farmers will not grow them as they will not be profitable.

Companies are establishing alliances to involve groups at all stages of the chain - breeding, seed production, agronomic management of crops, grain delivery, marketing, processing and consumers - with the aim of achieving profits at each stage. The producer will be affected not only by the cost of seed, but through an End Point Royalty imposed on delivery, and the price paid for the product. The pricing structures will have to be established so the producers benefit as well as the other stakeholders.

8. Other impediments to the utilisation of new varieties by small producers

There may be contractual obligations between the farmer and the seed supplier or the marketer that are not currently present.

9. Assistance to small producers to develop new varieties and the protection of rights of independent breeders in relation to genetically modified organisms

The development of genetically modified varieties requires considerable investment, access to key enabling technologies and resources to deal with the regulation requirements. It is difficult for public organisations and small companies to be involved without developing associations with the large companies. The implications are:

- The developments will be controlled by large private companies or alliances.
- There will be a shift in the organisation of plant breeding in Australia, with more commercial involvement.

There is a need to maintain publicly available technology which can be freely used by the public and smaller plant breeders. This will help maintain competitiveness and ensure that the benefits of new technology are made available to producers.

10. Appropriateness of current variety protection

The technology and the IP involved in genetically modified varieties are protected by patents. The seed of varieties can be protected by PBR.

Breeding organisations will move to the collection of End Point Royalties to provide the returns for their breeding activities. This will be essential if Australia is to maintain its standard of crop varieties, as governments are withdrawing funding and the commercial sector needs to be more involved. A major issue that needs to be resolved is the validity of using PBR legislation to collect end-point royalties.

11. Opportunities to educate the community of the benefits of gene technology

Informing the community should be a high priority, and should be undertaken in a focused and coordinated approach. Unfortunately the community is not well-informed about the benefits and potential risks of genetically modified crops, and the emotive

arguments of some minority groups do not contribute to a well-balanced debate. People need to have the opportunity to discuss the issues that concern them.

Some of the key features that need to be promoted in a community information campaign are:

- The process of traditional plant breeding and how the use of gene technology as a new tool can contribute to the traditional process.
- Genetic technology has the ability to provide significant improvements in the amount and quality of the world's food supply.
- Many of the improvements will reduce the use of chemicals, with implications for the environment. It will be useful to be able to list the benefits in terms that consumers understand.
- Many of the arguments against crops modified by gene technology are often not associated with the new technology *per se*. Often the same outcomes have been produced using traditional methods, without any protest.
- Crops modified by gene technology undergo stringent testing before they are released. This testing is far more stringent than crops produced conventionally.
- The risks from genetically modified organisms are small and identifiable. The risks are also not new - many of the suggested risks apply equally to traditional methods.
- Highlight the regulatory processes already in place and the way in which the new Office of the Gene Technology Regulator will work in conjunction with them.

12. Acknowledgements:

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