Speech by

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GENETIC ENGINEERING

Mr HEGARTY (Redlands—NPA) (12.10 p.m.): Genetic engineering is a recent phenomenon that is attracting world attention, not only in its application to the human species but also in biotechnology in agriculture. The major impact of genetic engineering on agriculture is that it is now possible to transfer genes from any organism—virus or bacteria, animal or human—into plants. This is causing a new revolution in agriculture. Recent examples of insect resistance in cotton and herbicide resistance in soya beans have been developed by transferring genes from bacteria into plants. Most of these recent scientific breakthroughs have been developed by private enterprise, and multinational corporations now control this intellectual property under patents.

One local industry that has benefited by biotech research is the cotton industry. Genetically engineered insect resistant cotton is now grown in Australia. A major advantage of the insect resistant cotton is that it greatly reduces the amount of poisonous insecticide that has to be used during the life of the crop to control insects. Cotton is a significant contributor to Queensland's rural economy.

A number of other genetically modified crop species could become available in the near future. An example is the virus resistant pawpaw plants being developed by Griffith University, Queensland's Department of Primary Industries and the Queensland University of Technology. The virus resistant strain of paw paw will protect the crop from a virus which has devastated crops in many overseas countries. The paw paw industry alone is worth approximately $12m to the Queensland economy.

Through tourists Australia now has a higher exposure to overseas agricultural diseases than in the past. There is no better proof of that than the outbreak of Newcastle disease in New South Wales, which breaks our long-held claim to immunity from that devastating disease.

Research is becoming vitally important in protecting our significant rural industries. Historically, research has resulted in new seed lines that are disease and insect resistant, produce high yields, provide better nutrition and utilise water efficiently, as well as cope with the constraints of different growing conditions. Without these breakthroughs, Australian agriculture would not be so cost efficient and perhaps would not enjoy access to some of the export markets we now have.

It is now possible for human milk protein to be genetically transferred into a crop, then extracted and used to make infant formula, instead of making formula out of cow's milk. People from Third World countries would benefit if the vaccine to stop diarrhoea were genetically introduced into a particular crop.

Whilst these are positive outcomes in biotechnology research, another development that has attracted my attention is a new type of seed variety recently developed in the USA designed to genetically control seed production. Called the technology protection system, or terminator technology, the genetically engineered plant is designed to kill the seed at maturity. This technology has been developed to protect previous and future breakthroughs in biotechnology—in other words, protecting high yield seed varieties that might be developed in the future and then illegally duplicated.

The genetically engineered plant contains three new genes—two from bacteria and one from another plant. A new plant gene has the ability to make the plant produce a lot of toxin that will kill cells and to confine that toxin to seeds. The gene is normally activated late in seed development. Thus, the embryo within the seed is killed as it is going through the last stages of development. The function of the bacterial genes is to help the newly introduced plant gene to work. Before sale, seeds of the plant will be treated with an antibiotic which activates a molecular switch in one of the bacteria genes. This

switch causes the new plant gene to begin to function, thus terminating its ability to reproduce. Under normal conditions, most growers retain seeds from their crops to use in the next planting season, a practice that has continued for the past 12,000 years. The terminator seed, however, will be used to kill seeds and force farmers to return and buy seed each season from the seed companies.

This technology raises a number of issues of concern. In major crops, large quantities of antibiotic solution will be used to treat the seeds. There is a worldwide concern over the unnecessary use of antibiotics, resulting in the development of antibiotic resistant organisms, for example golden staph in hospitals. Handling seed that has been soaked in antibiotics seems like a very tricky process, but there may be viable methods. Even at low-scale concentrations there will be a lot of a particular antibiotic to dispose of, and large-scale agricultural uses of antibiotics are already seen as a threat to their medical uses. Furthermore, the increased tolerance of bacteria, residual or waste antibiotics may also have a harmful effect on soil ecology.

A secondary concern is that these plants will produce pollen and every pollen grain will carry the terminator gene. If the terminator crop is planted in a paddock beside a standard variety, the pollen may be carried by insects or wind and terminate the seed in the standard variety. Consequently, there is potential for a grower to destroy the seed in a neighbour's crop. It is unlikely that the neighbouring grower will be able to tell that his seed has been pollinated, because it will probably look normal. He will not know what has happened until the following season when the seed does not germinate.

How many seeds will die in the neighbouring property will depend on the degree of crosspollination, and that is influenced by the species of plant, the variety of the crop, weather conditions, how close the fields are to each other and so on. If many seeds die, it will make saving seeds untenable for the adjacent farmer. Even if only a few seeds die, they will contain the toxin and any other proteins engineered into the terminator protected variety. These new components may make the seed unusable for certain purposes.

A third concern is the unknown effect on the nutrition of the food produced by these plants. Although the terminator gene is supposed to kill seeds very late in development, it is not known what other effects, if any, the terminator may have. Perhaps they will respond differently to changes in humidity or to infection with bacteria or fungi. This would make the partial killing of neighbours' crops even more of an issue. There may be nutritional changes in seeds that are killed late in development. Although most of their oils and protein are present, it is possible that seeds will start to deteriorate or lack some minor component that is important to human nutrition. The functional properties of specific molecules in food are just beginning to be appreciated and are likely to play an important role in preventing disease in the future. Another point for consideration is whether the toxin that kills the seed is safe for human consumption. Is this known? These possibilities require further studies before we unreservedly accept this new technology.

A fourth and major concern is that this type of technology has the potential to create a major food monopoly through restricted access to seeds and/or availability for purchase at a premium price. This problem is put into perspective if it is considered that the multinational corporation that has applied for the patent is now the world's second largest seed producer. The economic ramifications for Australians, both growers and consumers, could be considerable. With patents, the owner has the right to charge directly or by licence whatever they consider appropriate, or refuse to supply altogether. Whilst this may be anti-competitive, it is a commercial reality. It has been estimated that, globally, this technology could be used on over 400 million hectares and yield licensing fees of $US1.5 billion. Industrial espionage is not a new phenomenon, and this technology in the hands of unscrupulous people could be used to terminate the next generation of any species, including our native flora.

Like many other genetically engineered products for agriculture, such as bovine growth hormone, longer shelf life tomatoes and high nicotine tobacco, this is a product that serves the needs of industrial agriculture. This technology is designed to increase the profits of the multinational seed industry and has little to do with feeding the hungry peoples of the world or benefiting farmers.

I understand that the patent is pending in 87 countries, including Australia. I am alerting the State and Federal Governments, and particularly our Minister for Primary Industries, that this patent needs careful thought and scrutiny before it is granted. We are in the unusual position at this point in time of being able to say "no" to this particular patent being granted. I urge all honourable members to take note of this, particularly those representing rural electorates, as it could have a very detrimental and devastating effect on our rural industries. I encourage the Minister to immediately take this matter up with his Federal counterpart to ensure that it is being addressed before this patent is granted.

Time expired.
