

Transgenic plants and world agriculture

- 1 During the 21st century, humankind will be confronted with an extraordinary set of challenges. By 2030, it is estimated that 8 billion persons will populate the world - an increase of 2 billion people from today's population. Hunger and poverty around the globe must be addressed, while the life-support systems provided by the world's natural environment are maintained. Meeting these challenges will require new knowledge generated by continued scientific advances, the development of appropriate new technologies, and a broad dissemination of this knowledge and technology along with the capacity to use it throughout the world. It will also require that wise policies be implemented through informed decision-making on the part of national, state, and local governments in each nation.
- 2 GM technology was first developed in the 1970s. One of the most prominent developments, apart from the medical applications, has been the development of novel transgenic crop plant varieties. Many millions of hectares of commercially produced transgenic crops such as soybean, cotton, tobacco, potato and maize have been grown annually in a number of countries including the USA (28.7 m hectares in 1999), Canada (4 m), China (0.3 m), and Argentina (6.7 m) (James 1999). However, there has been much debate about the potential benefits and risks that may result from the use of such crops.
- 3 The many crucial decisions to be made in the area of biotechnology in the next century by private corporations, governments, and individuals will affect the future of humanity and the planet's natural resources. These decisions must be based on the best scientific information in order to allow effective choices of policy options. It is for this reason that representatives of seven of the world's academies of science have come together to provide recommendations to the developers and overseers of GM technology and to offer scientific perspectives to the ongoing public

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document 09/00

July 2000

Registered Charity No 207043

debate on the potential role of GM technology in world agriculture. The following conclusions, and other issues, are discussed in full in the report of the inter-Academy working group on transgenic plants in world agriculture which is available on the Royal Society's web page (www.royalsoc.ac.uk). Hard copies of the full document are available, free of charge, from the Science Advice section at the Royal Society (Dr Rebecca Bowden, Tel: 020 7451 2588, e mail: rebecca.bowden@royalsoc.ac.uk).

- 4 It is essential that we improve food production and distribution in order to feed and free from hunger a growing world population, while reducing environmental impacts and providing productive employment in low-income areas. This will require a proper and responsible utilization of scientific discoveries and new technologies. The developers and overseers of GM technology applied to plants and micro-organisms should make sure that their efforts address such needs
- 5 Foods can be produced through the use of GM technology that are, more nutritious, stable in storage and in principle health promoting - bringing benefits to consumers in both industrialized and developing nations
- 6 New public sector efforts are required for creating transgenic crops that benefit poor farmers in developing nations and improve their access to food through employment-intensive production of staples such as maize, rice, wheat, cassava, yams, sorghum, plantains and sweet potatoes. Co-operative efforts between the private and public sectors are needed to develop new transgenic crops that benefit consumers, especially in the developing world.
- 7 Concerted, organized efforts must be undertaken to investigate the potential environmental effects - both positive and negative - of GM technologies in their specific applications. These must be assessed against the background of effects from conventional agricultural technologies that are currently in use
- 8 Public health regulatory systems need to be put in place in every country to identify and monitor any potential adverse human health effects of transgenic plants, as for any other new variety.
- 9 Private corporations and research institutions should make arrangements to share GM technology, now held under strict patents and licensing agreements, with responsible scientists for use for hunger alleviation and to enhance food security in developing countries. In addition, special exemptions should be given to the world's poor farmers to protect them from inappropriate restrictions in propagating their crops.