

## The Promise of Crop Biotech

09 March 2005 | News

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The first conscious effort at biotechnology in agriculture is attributed to the 18th century Austrian monk, Gregor Mendel, who systematically cross-bred sweet peas. Since then, hybridization and controlled cross-cultivation have led to consistent improvements in the yield and nutritional content of crops. When Francis Crick and James Watson discovered DNA in 1953, we gained the capacity to cross-cultivate with a greater degree of precision. Rather than the mate-and-wait methods of conventional plant cultivation, crop biotechnology allows plant breeders to develop crop varieties more suitable for diverse growing locations.

Yet, in a 1998 survey gauging public sentiment towards biotech derived food, when respondents were asked the question: "Do you currently consume any foods that contain DNA?". Two thirds confidently answered 'No'. Yet ever since humans moved away from hunter-gatherer subsistence, genetic modification has been a fact of life in food production. Similarly, urea, now near indispensable in agriculture, was viewed with suspicion in the 1960s when organic manure ruled the roost. Motorized equipment replaced horses and manual labor so more acres could be cultivated. Hybrids improved the yield potential of traditional varieties. Pesticides helped in weed, insect and disease control.

History has shown that it takes time for new technologies to gain acceptance. Biotechnology is no different. But as with any new science, a decade of widespread use has demonstrated its safety and also converted many sceptics to die-hard proponents. There is no question that the technology has proven itself though we have only seen just a few applications. The next decade of plant biotechnology is expected to yield a new generation of products that will not only offer additional benefits to farmers but also give consumers improved nutrition, taste and choice.

Biotechnology is enabling farmers to grow more food, helping keep pace with a burgeoning global population. It is also enhancing sustainability by correcting some of the problems inherent in the earlier technologies. Farmers who planted insect-protected crops were able to reduce their use of chemical insecticides by millions of kilograms. The current insect-protected crops control the major insects in cotton and corn; future products are aimed at controlling more pests and diseases in more

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crops. This will bring even more reduction in chemical insecticide use.

In developing countries such as India and China, pesticide-reducing crops provide an even greater benefit in human safety. Pest-resistant crops have greatly reduced pesticide exposure to unskilled workers who often apply pesticides with backpacks and bare feet. Wildlife and the environment have benefited, as well.

New generation drought-tolerant crops will further expand the horizons of agriculture. With these crops, it may also be possible to grow foods in regions of the world that get little rainfall thus helping people in developing countries grow more food.

Greater consumer benefits are on the horizon too. A number of research institutions are developing ways to improve the nutritional content of foods. Some of the most advanced projects include healthier food oils designed to fight heart disease, tomatoes with high levels of cancer-fighting lycopene, food crops enriched with heart healthy Omega-3 fatty acids and other essential nutrients that could reduce the risk of heart disease, cancer and Alzheimer's disease.

Other technologies on the anvil include the discovery of a gene that may keep fruits and vegetables fresh longer, a tomato that ripens on the vine and tastes better, caffeine-free coffee that tastes better than beans de-caffeinated by chemicals, neutralisation of harmful allergens so that people on restricted diets can consume basic foods such as soybeans, wheat and groundnuts.

In the decade since biotech crops were first widely planted, millions of people have consumed foods containing biotech-derived ingredients almost everyday. Nearly a billion acres have been planted worldwide. There has not been a single confirmed problem concerning human or livestock safety. This is not surprising to scientific experts who evaluated biotech crops before they were ever allowed into the marketplace. The scientific research in support of biotech crops makes them the most thoroughly reviewed food products in the history of the world. More than 1,500 independent, peer-reviewed studies have verified their safety.

Because of its beneficial and sustainable impact on the basic elements of farming, it would not be surprising if biotechnology proves to become the most important agricultural advancement since the first farmer put a seed in the soil.