

# Modern biotechnology and biosafety in Africa

By Augustine Andoh and Dr Margaret Ottah Atikpo

**B**IOTECH is utilising the sciences of biology, chemistry, physics, engineering, computers, and information technology to develop tools and products that hold great promise. It involves the technological applications that use biological systems, living organisms or their derivatives to make or modify products or processes.

Humans have spent thousands of years selecting and cultivating the best traits nature has to offer.

Both traditional and modern biotechnologies share the same foundation: the use of living organisms to enhance crops, fuels, medical treatments and a host of other tools that can help humans.

Whereas modern biotechnology manipulates the genes of organisms and inserts them into other organisms to acquire the desired trait, traditional biotechnology harnesses the potential of processes performed by living organisms, such as fermentation.

Now with the help of biotechnology, nanotechnology and a host of other sciences, we are able to harness these traits at the atomic level to develop safe and beneficial crops, medical treatments, biofuels and household products.

New solutions could also reduce the problems of diseases and weeds,

thus promoting sustainable agricultural production in Africa.

Biotechnology could reduce the need for, and the high costs of, agrochemicals and water.

The African Union has been encouraging the adoption of Biosafety laws in Africa. It is in this light that Ghana's passage of Biosafety Act, 2011 or (Act 831) is interesting.

Following Presidential assent to Act 831, the Open Forum for Agricultural Biotechnology (OFAB-Ghana Chapter) and the programme on Strengthening Capacity for Safe Biotechnology Management in sub-Saharan Africa (SABIMA) "held" a joint meeting in Accra.

The OFAB-Ghana Chapter was launched in August 2011 to share ideas about modern biotechnology. SABIMA is a programme under the Forum for Agricultural Research in Africa (FARA) that is an agricultural arm of the African Union.

The theme of the meeting was "The new Biosafety law and its implications for biotechnology research in Ghana".

The meeting was also to launch a stewardship policy and deliberate on a safe and responsible application of

modern agricultural biotechnology.

The purpose of the Ghana Biosafety Act 831 of 2011 is to "regulate biotechnology and to provide for related matters". It contains 44 Sections or Clauses and 5 Schedules.

Act 831 seeks to set up a National Biosafety Authority to receive, process, respond and make decisions on applications for the use of genetically modified organisms in agricul-

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ture in Ghana.

It might seem that the provisions of Act 831 are stringent and might increase the costs of companies and organisations that might want to use biotech. It is therefore suggested that Parliament later reconsiders some of its stringent conditions.

Public opinion and perception here in Ghana and the world over has been deeply divided, sometimes acrimoniously so. Globally, the main proponents of GM foods are Americans, and the main sceptics are Europeans and

most of the developing world. Those in opposition believe that GM foods could trigger a wide variety of serious environmental and health problems with dire consequences to life on planet earth.

Scepticism about modern technology has its constituency. Fifty years after the application of irradiation to foods, it is yet to be seen as having been acceptable to society in general.

Even some pro-biotech exponents would like to draw a distinction between the emerging African Biotech and that of industrialised countries.

Africa needs to be wary of the level of biotech of industrialised countries where technologies are patented and often fraught with legal disputes about its application because of profit motives.

Advocates of GM crops say there is about 16 years proven safety record. Benefits accruing to small-scale farmers include increased gross margin (114 per cent), reduction in pesticide use (62-96 per cent) and improved yields (18-29 per cent).

The practice of selective breeding to enhance desirable traits in both domesticated crops and animals has been pursued by human populations since at least the beginning of recorded time.

We had old biotechnology that involved fermentation, as in bread bak-

ing or the making of beer.

New biotechnology involves horizontal genetic manipulation across crop or animal species to make better breeds.

Many African countries have deployed genetic engineering. Kenya has been developing virus-resistant transgenic sweet potato. Egypt has developed transgenic potato, maize, faba bean and tomato projects, and South Africa has been working on new tobacco and cotton varieties with resistance to herbicides.

In Africa, a number of countries have embarked on the use of Rhizobium inoculant in the production of grain legumes to address the problems of soil fertility and fertiliser application. The use of tissue culture is also common place in several countries and has resulted in increased production of banana, pyrethrum, potato, cassava and sugarcane.

In future, biotechnology will be used in particular to manufacture various ingredients such as food flavours and stabilising agents that may be used in food.

*Augustine Andoh is a Public Relations Officer, while Dr Margaret Ottah Atikpo is a Microbiologist, Food Scientist and Head of the Microbiology Division of the Food Research Institute of the Council for Scientific and Industrial Research (CSIR-FRI).*