

# Biotechnology brightens the future for local tomato farmers

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Tomato growers and dealers in Kenya may soon have reason to smile. The tomato holds the distinction of being the first genetically modified food known to have been sold to consumers in the United States.

Provided the improved tomato meets Kenya's safety measures and guidelines on biotechnology transfer, losses arising from spoilage will be a thing of the past. But, as of now, years after this tomato hit the market, Kenyans are yet to benefit from the technology.

Hope lies in the fact that, Kenya has made efforts to formulate biosafety guidelines.

The *Flavor Savr* tomato boasts the ability to stay for long without getting spoilt.

A gene incorporated into it is responsible for rendering the tomato hard even when ripe.

Basically, this tomato has the unique quality of delayed ripening, which enhances its fresh market value.

The tomato developed by a company called Calgene got its new genes from tomatoes, bacteria and a virus.

It hit the market in 1994 following approval by the US Department of Agriculture and the Food and Drug Administration agency.

Another company, DNA Plant Technology released into the market a year later, a similar commodity, named *Endless Summer*.

Zeneca/Patoseed genetically engineered a thicker tomato with more pectin and less water for enhanced processing value, released into the market in 1996.

The hot tropical conditions, as well as the perishable nature of the tomatoes grown in the country makes dealing in the crop a precarious undertaking. The perishability of tomatoes is responsible for wide swings in the incomes of growers and dealers.

Mr Peter Kiio, a tomato seller in Nairobi says growers can make heavy losses if the tomatoes they are dealing in are the type with a lot of water. "These lose quality very fast. They are not very popular."

Thanks to biotechnology, this seller and his colleagues, as well as tomato farmers may soon be complaining about other matters, and not the poor keeping quality of the crop.

Crops are generally highly perishable in the tropics and, controlling post-harvest losses in tropical fruits like bananas, mangoes and pawpaws is a headache.

The ordinary tomato, *Lycopersicon esculentum* is a highly perishable commodity, too.

The tomato, though considered a minor crop, is source of livelihoods for many farmers in the high rainfall districts of the country in Central Province, Western, Eastern, Rift Valley and Nyanza

technologies

Of all biotechnology forms, tissue culture has been used more widely, although, compared to application elsewhere the technology has been, to a large extent, a theoretical approach.

Tissue culture has been used in pyrethrum, bananas, sweet potatoes and Irish potatoes, in the multiplication of clean, disease-free planting material.

It is notable that biotechnology offers solutions to some persistent problems in agriculture, but the issue of safety measures lingers.

Biotechnology is the integrated use of molecular genetics, biochemistry, microbiology and process technology to produce goods and services.

One aspect of biotechnology, genetic engineering, which involves the manipulation of genes poses unknown risks to users. The risks are the concern of environmentalists and nations.

Genes of economic benefit/importance in agriculture in developed countries can be brought to Africa. But, like for Kenya, the safety margins have to come from the receiving countries.

Biotechnology has been employed to combat plant and livestock diseases, insects and weeds and in increasing drought resistance in crops such as maize and cotton.

There is less supply of tomatoes when it rains heavily. The rainy season is associated with poor infrastructure, and the result is that, fewer tomatoes reach the market. Furthermore, the rains also spoil the crop while still in the shamba.

The expenses growers incur force them to sell the tomatoes they have harvested — at whatever price, so that they may recover some money.

Growers encounter a number of pests which include the American bollworm, the tomato white fly and the red spider mite. Diseases include early and late blights and leaf sport. All these require investment in pesticides and fungicides.

Farm inputs an expense that farmers must cater for if they are to get reasonable yields include fertilisers, pesticides, fungicides and farm machinery.

The seasonality of output leads to oversupply and shortages during certain seasons.

Oversupply depresses prices, but farmers have no alternative but to accept low offer, to at least get rid of the tomatoes which would end up getting spoilt if farmers choose to be obstinate.

The low price elasticity of demand for agricultural products (whether prices are reduced, consumption does not increase) affects tomatoes, too. Growers cannot expect to sell more tomatoes and avoid over-