

'THE BENEFITS OF BIOTECH ARE IMMENSE'

SAYS A SIVRAMIAH SHANTARAM IN AN INTERVIEW WITH DARINIA KHONGWIR

What drew you towards biotechnology?

Because of my academic background and experience in life sciences, I have always dreamt of being able to transfer nitrogen fixation genes from Rhizobium to plants that do not have them. That will help plants to trap bountiful atmospheric nitrogen by themselves without the need for applying chemical nitrogenous fertilizer. This has been the century old quest of scientists in modern agriculture.

How widely used are the biotechnology crops across the world and India?

Biotechnology is widely used in almost all crops around the world. More than 24 countries around the world grow biotech crops including India. India has invested hundreds of millions of dollars in agricultural biotech R&D through its Department of Biotechnology and the Indian Council of Agricultural Research since 1992. However, India is legally growing only one biotech crop, viz. Bt cotton, where we know that millions of farmers across the country benefit immensely.

Mention the agricultural plants available in genetically modified seeds.

Some of the biotech-enhanced seeds include insect-protected Bt cotton, Bt maize, herbicide resistant soybean, corn and cotton, Bt tomato, virus-resistant squash, delayed fruit ripening tomato etc.

Is biotechnology safe?

Biotech enhanced food and feed products have a 13-year history of safe use worldwide. Seeds improved with plant biotech are studied more extensively than any other plant product, providing equal or greater assurance of safety of these products compared to conventional plant varieties. Plant biotechnology is as safe as any other technology used in agriculture.

There have been regulatory review documents that can testify to the safety of biotech crops

Biotech crops have been evaluated for their genetic and overall biological stability by dozens of regulatory authorities around the world and endorsed by approximately 25 Nobel Prize winners and 3,400 prominent scientists including the Royal Society (UK), the World Health Organization (WHO), the UN Food and Agriculture Organization (FAO) among others. They have expressed their support for the advantages and safety of genetically modified foods and crops as a "powerful and safe" way to improve agriculture and the environment. Biotech crops have been grown and consumed for more than a dozen years in more than 24 countries of the world. And, yet, there's not a single report of anybody's health being affected by GM crops and no verifiable evidence of any environmental harm. Moreover, there are many peer reviewed scientific publications and regulatory review documents that can testify to the safety of biotech crops. Therefore, it is safe to say that biotechnology is safe.

What are the advantages of biotech?

The benefits of biotechnology, today and in the future, are immense. Biotech crops offer many positive and significant environmental and social benefits.

Today, the world is faced with many challenges of a growing population, rising needs, depleting natural resources among others. Humanity must respond to the growing pressures on the earth's natural resources to feed more people. Traditional farming ceases to provide us answers for feeding, fuelling and clothing the current and future generations. What we need is increasing yield in a sustainable manner. Biotechnology applied in agriculture can do this.

Experts assert that biotechnology innovations will triple crop yields without requiring any additional farmland, saving valuable rain forests and animal habitats. Other innovations can reduce or eliminate reliance on pesticides and herbicides that may contribute to environmental degradation. Still others will preserve precious groundsoils and water resources. Research in plant biotechnology can contribute to food security and more affordable food, thereby addressing hunger and poverty. It also contributes to biodiversity in a significant way and reduces the impact of agriculture on the environment. Overall, it is environmentally benign and a cost effective option.

The advantages of biotechnology is to employ living organisms to carry out both utilitarian and beneficial functions in the most proficient and sustainable way. They consume no external energy and other natural resources, which are becoming scarce. Biotechnology is a transformative technology that is already changing the way we live. It has great applications in medicine, agriculture and environmental protection. Plant biotechnology is truly one of the most transformative technologies of the 21st century. A clear example is Bt cotton — the only biotech crop technology approved for cultivation in India which made the country the world's second largest producer and exporter of cotton by doubling that nation's cotton productivity within seven years of the launch of Bt cotton in 2002.

What is the future of this field? What are the educational qualifications needed to be in this field?

The field of biotechnology is as big as the living world.

Considering the kind of novel and new researches taking place, the sky is the limit for the application of biotechnology. The 21st century belongs to the biotech and information technology, and I highly recommend pursuit of biotechnology to students. The biotech industry offers career on streams of pharma, agriculture, life sciences etc. There are ample opportunities thrown up for Biotech students (BTech, MTech or PhDs).

New biology of the last 50 years is now the basis of commercializing it into biotechnology. The speed with which biotechnology is being applied boggles the mind. However, it is important to bear in mind that students should first get proficient in

basic sciences, and start thinking about using that knowledge to solve problems. Biotechnology is all about solving problems.

There is a great future in biomedical biotechnology, agricultural biotechnology and environmental biotechnology. Saving the environment of our planet is the most crucial issue and it will need biotechnology to get the job done.

(A Sivramiah Shantharam, from Bangalore, is a senior research scholar in Science, Technology and Environmental Policy (STEP) at Woodrow Wilson School of Public and International Affairs, Princeton University)

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