

Biotechnology: the driving force of agri-research

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A developing country like Pakistan needs to benefit from the new advances in technology, no doubt! It should avail all the opportunities offered by biotechnology and genetic engineering in boosting the much wanted agricultural productivity. The world population is projected to reach eight billion by 2030 and upto ten billion by 2050. Approximately, 90% of the global population will reside in Asia, Africa and Latin America. Today, 840 million people in the developing countries suffer from malnutrition and 1.3 billion are affected by poverty. Without biotech, we may be unable to feed them, as biological technologies are moving exceedingly faster than could have been predicted a few years ago.

One can safely say that the per hectare yields have doubled during the past 50 years by application of non-conventional technologies and by expansion in the cropping area, increase in the number of improved crop varieties, breeding and hybridization, irrigation and mechanization etc. Frankly speaking, these options have already exhausted to a large extent, as the stereotype expensive NPK applications are bound to ultimately harm the ecosystem in the long run. We are

aware that the energy costs are rising, and the genetic improvement of crops using traditional approaches are too slow to cope with the rapid advancements in science and technology. Further, improvements in agricultural and livestock production and productivity have to rely on technological innovations, improved productivity and rapid shift towards commercialization, accompanied by increased production of high value commodities. Resultantly, the nation faces enormous agricultural challenge which is too big for a resource poor country like Pakistan. Keeping in view the ongoing global trends over the past 2-3 decades, the financial resources are going to shrink further and are likely to be concentrated in the hands of a few rich nations, whereas, majority of the world population will suffer from poverty, food shortage and malnutrition.

The Ministry of Science and Technology (MOST) has done a commendable job to select biotechnology as one of the priority areas. Recently, a National Commission on Biotechnology has been constituted with some of the internationally renowned scientists as its members. The Commission is working hard to fund projects in the area of biotechnology. However, to further strengthen the Commission more representation of scientists from the agriculture sector would be

more appropriate.

Analysing the success stories of biotechnology products in countries like China, it may be mentioned that an encouraging feature of China's advances in biotechnology was attributed to the growth of Government investment in agricultural biotechnology research. Investments in agricultural biotechnology in China have increased significantly since early 1980's. No wonder, China has now taken the lead in Agricultural Biotechnology by testing dozens of transgenics. The neighboring country India has a separate ministry of biotechnology, and is way ahead in agricultural biotechnology. Recently, India has approved cultivation of genetically engineered modified varieties of cotton. In sharp contrast, biotechnology developments in Pakistan have been ostensible, lacking a crisp focus on agriculture biotechnology and is being used as an umbrella to cover every possible technology under the sky. Somersaults in the identification of relevant areas has resulted in lopsided funding which favours the already developed centres, putting the resource starved centres at a disadvantage.

Policy Guidelines

There can be no doubt that we need biotechnology, but there is a big question mark about its management and regula-

tion. Agricultural biotechnology in Pakistan must be managed and regulated in such a manner that it should address real issues related to food security, export orientation, import substitution and poverty alleviation. An encouraging feature would be focus on agricultural biotechnology research and application to ensure that the food security objectives and the farmer's demands for specific traits in crops are incorporated into priority setting. There is a need to identify institutes/research centres which are actively engaged in agricultural biotechnology and have a track success record.

Such success stories can serve as role models. Furthermore, use of the term biotechnology should not be indiscriminate but specific and to the point. The policy guidelines need to assess the positive effects and the areas of concern, the biotechnological options available and relevant to meet the basic needs. Its application in agriculture, health, medicine and environment should be clearly focussed. Utmost care must be taken to identify experts who could address a specific field e.g. an expert in biotechnology with a heterogeneous background in various disciplines cannot address issues related to agricultural biotechnology.

There is an urgent need to pick appropriate technology which has a potential to deliver in a finite time frame with

a visible impact. Some of the potential gains that can be achieved with this technology are higher yields, enhanced product quality, lower pesticide application and labor cost. Such gains are particularly important in the developing countries. The use of high yielding, disease and pest resistant crops will have a direct bearing on improved food security, poverty alleviation and environmental conservation.

Conclusion

In summary, value addition of agricultural commodities by use of biotechnology would act as a driving force for the growth of biotechnology industry. It should therefore be recognized among the flagship technologies to help the country acquire a developed status. As a matter of national policy, the Government needs to promote agricultural biotechnology as a major thrust in the country's economic, scientific and technological development. Biotechnology policy with a strategy for export orientation and import substitution must be drawn as a blueprint to harness the commercial application of biotechnology.

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