

The Imperative of Seed Technologies for Enhancing Agricultural Productivity

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As per a study conducted by UNICEF nearly 55 percent of Asia's population is expected to reside in urban areas by 2030, and that, is a concern for food security and nutrition. The Asia-Pacific Overview of Food Security and Nutrition 2022 draws particular attention to urban food security and nutrition, the study highlights how urbanization and an increase in low-income settlements, accompanied by rising food prices are making access to healthy diets more difficult. As per the report, a healthy diet is unaffordable in most countries of Asia and the Pacific for nearly two billion inhabitants (1.9 billion persons, which is 44.5 percent of the region's population). This makes it difficult for agriculture systems to meet the ever-increasing demand for food supply. Agriculture remains the backbone of many Asian economies, employing a substantial workforce and ensuring food security becomes crucial.

The country's farmers play a vital role in feeding the nation and driving economic growth. According to an article by The World Economic Forum, 86 per cent of smallholder farmers and marginal farmers depends on agriculture as their primary source of income. In the dynamic landscape of agriculture, where climate patterns are becoming even more drastic and intense, the world population is multiplying manifold, farmers are at crossroads to produce more to sustain the food security of the globe. Given the situation, it becomes essential to explore ways to enhance agricultural productivity and address the challenges faced by the sector.

Seed technologies offer a pathway to transform agriculture

Seed technologies offer a pathway to revolutionize agriculture by enhancing crop productivity, improving yield quality, and equipping farmers with resilient and high-performing varieties tailored to specific challenges and requirements. These advancements empower farmers to optimize their output, adopt sustainable practices, and contribute to global food security. Seed technologies include hybrid seeds, advanced breeding techniques, and genetic engineering. By adopting high-yielding hybrid seeds in crops where hybrids are available, farmers can significantly enhance crop productivity, adapt to changing environmental conditions, and meet the demands of a growing population. Additionally, the integration of modern breeding techniques allows for the development of crop varieties with improved traits such as disease resistance, drought tolerance, and higher nutritional content. Seed technologies have the potential to revolutionize crop production in Asia and the Pacific.

By incorporating hybrid seeds, farmers can achieve higher yields, improved crop quality, and increased profitability. For example, the adoption of hybrid rice varieties in several Asian countries has led to substantial increases in rice production, ensuring food security and reducing reliance on imports. Similarly, hybrid vegetable seeds have helped boost vegetable yields, ensuring a stable supply of nutritious produce.

Even hybrid oilseeds, like mustard, groundnut, and sunflower have the potential to produce 2-3X yield contributing to a 2-4 percent increase in oil output when compared to other varieties, which not only can provide farmers with a stable source of income but also meet the rising demand for edible oils. Hybrid millet is more resistant to pests and diseases, which helps to reduce crop losses. They are tolerant of drought and heat, which makes them a more reliable crop for changing global climatic patterns and yearn for higher yields than traditional varieties.

Today, maize production is not only aiding in satiating global food hunger but also helping to meet the growing demand for multiple other by-products like ethanol, starch, and silage. Ethanol demand is expected to grow in the coming years, as more countries adopt policies to promote the use of renewable fuels. Increased corn output will help to ensure that there is enough feedstock available to meet this growing demand. In such circumstances, it becomes clear that seed technologies present a promising solution to unlocking the full potential of the agriculture sector giving rise to sustainable practices.

As per the latest market analysis by Mordor Intelligence, the Asia-Pacific seed market size & share analysis and predicts growth trends & forecasts up to 2028. In the Asia-Pacific region, hybrid seeds dominated the seed market, with a share of 65.2 per cent in 2021 in terms of value. Out of the total hybrid seed market value, row crops accounted for an 86.3 per cent share, whereas vegetables accounted for a 13.7 per cent share in 2021. These factors are testimonials of the growth of the Asia-Pacific seed market.

Seed technologies contribute to sustainable agriculture practices

The environmental sustainability of agricultural production is increasingly under threat. Moreover, as countries in the region have become more urbanized and demand for processed foods has risen, inadequate food safety systems and related food safety hazards have created a new form of food insecurity. By developing crop varieties that require fewer inputs, such as water and fertilizers, the environmental impact of agriculture can be reduced. Moreover, the utilization of genetically modified crops with enhanced pest resistance can promote integrated and more sustainable approaches to pest management. A holistic approach that combines seed technologies with agroecological principles can drive the transition towards sustainable and environmentally friendly agriculture in the region. Seed technologies can play a vital role in building climate-resilient agricultural systems. By developing crop varieties that are tolerant to drought, heat, or flooding, farmers can mitigate the adverse impacts of climate change and safeguard their livelihoods. Furthermore, the incorporation of genome editing as an additional tool of plant breeding can help develop crops with improved stress tolerance and resource-use efficiency. The regulatory framework has to be in place both globally and in-country to seamlessly integrate these technologies.

Empowering smallholder farmers: Road Ahead for adoption of innovative technologies

Across Asia, agriculture serves as a major contributor to the economy and a primary source of income for rural communities. Smallholder farmers constitute a significant portion of the agricultural workforce. Empowering them with seed technologies is crucial for poverty alleviation and rural development. Access to high-quality seeds, technical support, and knowledge transfer is essential for smallholder farmers to adopt seed technologies successfully.

To maximize the potential of seed technologies, collaboration among various stakeholders is crucial. Governments, research institutions, seed companies, and farmers' organizations should work together to create an enabling environment for the development, adoption, and dissemination of seed technologies. This includes investing in research and development, strengthening seed regulatory systems, ensuring intellectual property rights protection, and promoting knowledge sharing and capacity building. This also includes giving access to affordable improved seeds to ensure that smallholder farmers can fully benefit from seed technologies.

It is a need to aggressively foster an environment wherein policy enables changes in new seed technology area, while the private sector brings in more comprehensive and sustainable solutions and work in tandem with a vision to increase productivity and quality of produce, to enrich the lives of those who produce and those who consume, ensuring progress for generations to come.

In conclusion, the need for seed technologies in enhancing agricultural productivity cannot be overstated, especially in the dynamic and populous regions of Asia, where food security and sustainable farming practices are paramount. The adoption of seed technologies is offering a transformative pathway to revolutionize agriculture, empowering farmers to optimize output, improve crop quality, and meet the ever-increasing demand for food supply. Moreover, seed technologies contribute to sustainable agricultural practices by reducing environmental impacts through resource-efficient crops and genetically modified varieties with enhanced pest resistance. By building climate-resilient agricultural systems, farmers can mitigate the adverse effects of climate change and safeguard their livelihoods. As the world continues to evolve and face new challenges, seed technologies hold the promise of transforming agriculture, securing food supplies, and paving the way toward a brighter and more prosperous future.