

India fields technology to boost farmers' crop yields

Synopsis

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A drone being used for spraying pesticides on farms.

India's farm sector is increasingly embracing **technology** at various levels and industry is coveting the huge potential for tech-driven interventions that can possibly change agriculture landscape two decades from now.

Besides mechanisation of farming, technology penetration in the Indian agriculture sector is happening at multiple levels: policy interventions, digital innovations and biotechnology. In June, Bain & Co estimated that a \$30-35 billion value pool will be created in agri-logistics, offtake, and agri-input delivery in India by 2025.

Quite a few agri-tech firms are developing a range of smart solutions to problems that farmers suffer daily. These AI and machine learning solutions like drones and precision farming techniques are aiding farmers past all stages from sowing to crop protection and nutrition, cultivation and harvest to connecting them to non-traditional markets. The use of GIS maps, use of satellite data for weather forecasting and new methods to spray pesticides is also taking off. Investments in agrifood startups in fiscal year 2020 stood at \$ 1.1 billion, according to AgFunder, a US foodtech and agritech VC.

Ram Kaundinya, director general, Federation of Seed Industry of India (FSII), said technology can help agriculture **take NSE -1.38 %** a huge leap in the next 25 years compared to what it was able to achieve in the past half century. "Technology can make farmers' lives easier, predictable and profitable, and increase food production,"

Unlike digital technology which has gained some ground, biotechnology in agriculture is still at a nascent stage. Agriculture scientists working on genetic engineering and molecular diagnostics see immense possibilities in the lab-to-field use of biotechnology.

Rajeev K Varshney, research programme director (accelerated crop improvement) at the **International Crops Research Institute** for the **Semi Arid Tropics (ICRISAT)** says advances in genome sequencing and other technologies have made it possible to identify genes for agronomic traits. "As a result, a range of biotechnology approaches including genomics-assisted breeding, genetic engineering and gene editing can be used to develop crop varieties with enhanced tolerance to biotic and abiotic stresses and also with better nutrition."

Experts are betting big on these technologies to increase crop yield, bring stability in production, and make crops resistant to pests and ecological changes and also improve the post-harvesting shelf life.

Varshney's team along with other research institutes has developed several drought tolerant and disease resistant chickpea varieties through genomics-assisted breeding that provided 15-28% higher yield in pilot studies.

Bhagirath Choudhary, founder director of South Asia Biotechnology Centre sees edible oil as one such area where GM crops can help the country minimise the deficit. "We consume 22-23 million tonnes of edible oil annually, of which 15 million tonnes is imported. Import dependency can be reduced by increasing the production of soybean, sunflower, mustard seeds using biotechnology," he says while wondering why the government has no qualms about the imported edible oil which is mostly sourced through GM crops but it is not encouraged among Indian farmers.

While most agriculture experts are optimistic about wide-scale technology adoption, their hope comes with a rider. They see policy support and clearing regulatory logjams as crucial to march ahead. "Regulatory policies must be progressive and positive, be it allowing GM crops or permission to use drones for precision farming," said FSII's Ram Kaundinya.

Some experts, however, are sceptical about the push for technology. Food and policy analyst Devinder Sharma sees the focus on boosting production as a misplaced priority. "Food production is not an issue, but wastage of food as a result of fragmented food systems is," he said.

According to Sharma, another challenge going ahead is to improve farmers' income, which technology alone cannot solve. "If technology was the solution, why is there farmers' distress in the most advanced European countries and the US?" he asks.

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