beej ki baat
voice of the seed

EDITION DECEMBER 2024

Raghavan Sampathkumar
Executive Director

Greetings,

As 2024 draws to a close, we reflect on a year of remarkable advancements in agriculture and biotechnology. This December edition of Beej Ki Baat highlights groundbreaking innovations that promise to shape the future of farming and food security. From Haryana's success with herbicide-tolerant rice to gene-edited tomatoes that balance sweetness with size, the transformative potential of CRISPR technology continues to unlock new possibilities.

Global collaboration in climate-smart agriculture, as seen in COP29 investments, and natural solutions to crop challenges, like BHU's maize fungus discovery, underscore the sector's resilience and adaptability. With an eye toward sustainable practices and agrifood systems, the insights shared in this issue aim to inspire and inform as we enter a new year.

Let us continue to harness science and innovation to meet the challenges ahead.

FSII In News

Mr Ajai Rana, Chairman-FSII, discussed his journey in the seed industry

[Dr. Venkatram Vasantavada, Director- FSII, on "Rethinking Agriculture with High-Yield, Nutrient-Rich Seed Innovations."]

"Adopting precision farming technologies and digital tools can further enhance productivity and resilience in the cotton sector"

DR M RAMASAMI, Founder & Chairman, Rasi Seeds (P) Ltd

Rasi Seeds is a leading company which specialises in producing quality hybrid seeds. The company's team with advanced genetic engineering and breeding technologies create seeds of required attributes along with robust biotic and abiotic stress resistance that suit varying agro-climatic conditions. In an interaction with AgroSpectrum, Dr M Ramasami, Founder & Chairman of Rasi Seeds (P) Ltd shared his views on genetically modified (GM) and hybrid seeds for sustainable production of cotton in India. Edited excerpts:

How is Rasi Seeds contributing to reviving cotton production in India?

We are reviving self-sufficiency in cotton production in India by improving genetics by providing high-yielding, pest-resistant and high-density planting system (HDPS) cotton hybrids with improved agronomic parameters tailored to diverse agro-climatic zones. The company's commitment to innovation has led to the development of bollworm-resistant Bt cotton hybrids, which significantly reduce crop losses and pesticide dependence, thus promoting sustainable cotton farming. With a strong focus on quality, we ensure genetic purity in its seed production and processing, ensuring consistent and reliable yields for farmers. Additionally, its 'farmers first' approach includes offering timely support, guidance, and training programmes to enhance farmers' skills in pest management, water conservation, and soil health. These comprehensive efforts not only boost productivity but also strengthen the local supply chain, helping India to attain self-sufficiency in cotton and supporting rural economic stability.

What inputs are required for the growth of the cotton farming industry in India?

India's cotton farming industry struggle with issues like pest infestations (notably pink bollworm and CLCuV), soil degradation, water scarcity, and outdated agronomic practices, all of which hinder productivity and economic stability for farmers. [illegible] these issues requires key inputs: pest-[illegible]d climate-resilient varieties/hybrids, such as genetically modified (GM) and hybrid seeds tailored to Indian conditions, can significantly improve yields and reduce losses. Sustainable soil management practices, including balanced fertilisation and crop rotation, are essential to maintain soil health. Efficient irrigation techniques, like drip irrigation, help to manage water resources effectively in the regions facing water scarcity.

Supportive government policies offering subsidies and affordable credit, along with farmer education programmes, empower farmers with knowledge of best practices and market insights. Additionally, adopting precision farming technologies and digital tools can further enhance productivity and resilience in the cotton sector, driving India as a global leader in cotton production. However, regulatory hurdles, such as lengthy approval processes and complex compliance requirements for GM cotton, often hinder the adoption of these technologies. Streamlining the regulatory framework with clear, science-based guidelines, expedited approvals, and increased transparency could accelerate access to innovative genetically engineered seeds, ultimately strengthening the entire industry and supporting India's agricultural economy.

Rasi Seeds is working on the application of Gene-editing technology for Rice, Cotton and Mustard for increasing yield and other economically important traits. Can you elaborate more on this?

We are currently in the exploratory phase, concentrating on building capacity in gene-editing technology. We plan to initiate projects once the licensing issues are resolved. While genome editing technology is freely available to academic institutions for research and development purposes, its licensing for commercial use poses significant challenges. Government support and subsidies for accessing this technology through centralised platforms could facilitate broader adoption and innovation in the industry.

The lack of a clear IP policy for seeds acts as a deterrent to R&D investment by the seed industry. Formulating a comprehensive seed strategy, including clear guidelines on patents and the Plant Variety Protection Act (PVPA), is essential to encourage investment and innovation in genome editing technologies.

Recently the Supreme Court said that the government should conduct a national consultation, to formulate a National Policy on GM crops. Considering this, what preparations are required for the adoption and commercialisation of the seeds developed using GM technology in India?

With nearly three decades of a well-developed regulatory system, there is considerable experience in both approving and rejecting various events based on established criteria. For seamless and effective implementation, streamlining these existing guidelines with transparent, science-based protocols would help address both safety and efficiency. Enhanced collaboration between regulatory bodies and agricultural scientists is essential to build a thorough, consistent framework for GM crop approval. Additionally, raising awareness and conducting capacity-building programmes can prepare farmers for the responsible adoption of GM technology while minimising environmental risks and aligning with the regulatory standards in place.

Rasi Seeds has collaborated with the Central Institute of Cotton Research (CICR) and Tamil Nadu Agriculture University (TNAU) to drive research projects on cotton crop improvement. How will it benefit in developing new seed varieties?

Our collaboration with CICR is on the "Development of CLCuD-resistant Gossypium hirsutum genotypes" using elite exotic germplasm resources and their cross derivatives. Additionally, CICR and Rasi will conduct season-long monitoring and management of pink bollworm in cotton crops in the northern zone and study the dynamics of the bollworm disease complex in upland cotton across India. Rasi Seeds has also signed an MoU with TNAU for genomic selection in cotton, aimed at accelerating genetic improvements in fibre yield and quality. By partnering with these esteemed research institutions, Rasi Seeds gains access to cutting-edge research, extensive genetic resources, and expert insights into cotton breeding and genetics, which accelerates the development of pest-resistant, high-yielding, and climate-resilient cotton varieties. This collaboration allows Rasi Seeds to integrate advanced traits, such as resistance to CLCuV, Pink bollworm and tolerance to drought, into its seed lines with precision and efficiency, offering superior performance to meet the challenges faced by Indian cotton farmers.

Any new opportunities on the horizon for Indian seed companies in the global seed market?

Indian seed companies have diverse opportunities across global markets, especially in regions like Africa, Asia, and Latin America, where agricultural needs align closely with India's expertise in developing resilient and adaptable seed varieties. In African countries, there is a strong demand for drought-resistant and pest-tolerant crops, such as maize, rice, and cotton, as these regions face similar climate challenges as India. Indian companies can provide hybrid and genetically modified (GM) seeds that enhance yields and withstand harsh conditions, supporting food security across the continent.

In nations like Indonesia, Vietnam, and the Philippines, Indian companies have an opportunity to supply rice, maize and vegetable hybrids tailored to the region's tropical climates and local preferences. India's genetic engineering expertise can help these countries address yield challenges and post losses, improving food availability and reducing dependence on imports. In these markets, strategic partnerships and collaborations can boost entry and regulatory acceptance. Together, these international opportunities enable Indian seed companies to expand their footprint, share cutting-edge technologies, and promote sustainable agriculture worldwide.

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[Dr. M Ramasami, Founding Chairman-FSII discusses the transformative role of precision farming and digital tools]

INDIA

Minister highlights Quality Seeds as Key to Agricultural Growth at 13th National Seed Congress

Union Minister for Agriculture, Farmers' Welfare, and Rural Development, Shri Shivraj Singh Chouhan, virtually inaugurated the 13th National Seed Congress (NSC) in Varanasi, Uttar Pradesh. Senior officials including Dr. Himanshu Pathak, Director General of ICAR, and Faiz Ahmed Kidwai, Additional Secretary of Agriculture, were present alongside numerous policymakers, researchers, and industry stakeholders.

Read full article...

Haryana Leads the Way with Direct Sown Rice (DSR) Using Herbicide-Tolerant Basmati Varieties

Let science guide the shift to sustainable farming

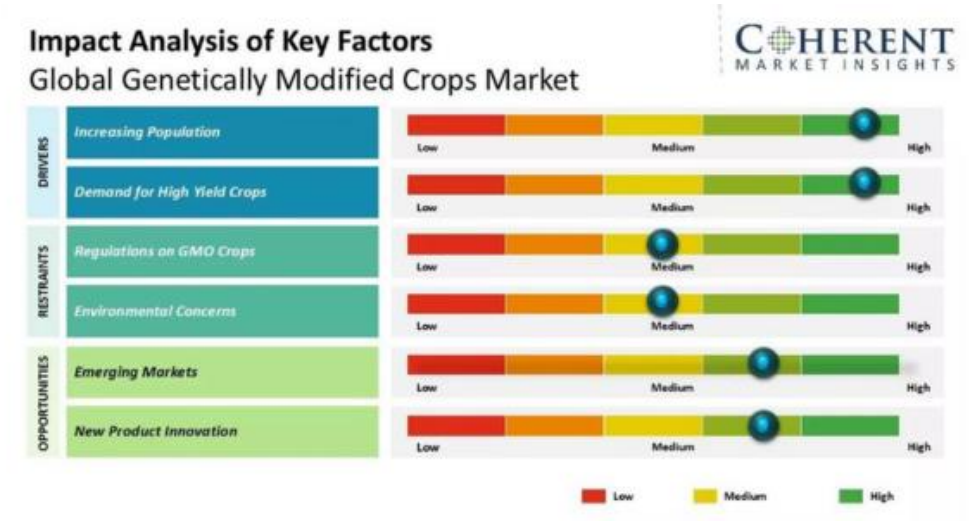
Need to boost availability of quality seeds at affordable rate through PPP model Agri Min

[Maize diversion for ethanol raises poultry feed, edible oil prices, sparking concerns for sugar industry, soybean farmers]

[Government funds 28 innovations to combat tomato price volatility and wastage]

[BHU scientists discover a natural method to protect maize crops from the destructive fungus]

GLOBAL



GM Crop Market Projected to Reach USD 36 Billion by 2031

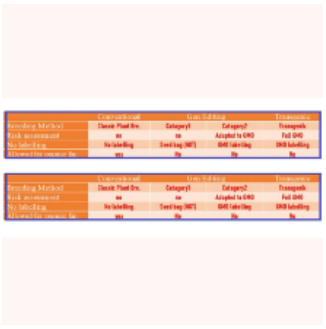
The global market of genetically modified crops is projected to be valued at USD 24.80 billion in 2024 and expected to reach USD 35.56 billion with a compound annual growth rate of 5.3% during this period. The report of Coherent Market Insights on GM crops market size and trends has identified population increase and demand for high-yielding

crops as the primary drivers of the market. Meanwhile, regulations and environmental concerns surrounding the technology were enumerated as the restraints on growth.

Read full article...

Climate-smart agriculture investments at COP29 nearly double

COP29: New FAO analysis maps Nationally Determined Contributions, identifies opportunities, gaps and risks related to agrifood climate solutions



More than 40 gene-edited crops will be available to European farmers only when the EU deregulates crop biotechnology

Global Seed Vault Receives Largest Deposit, Ensuring Crop Diversity Amidst Climate Change and Conflict

Australia keen to explore opportunities in India's agri-tech space: Govt

Global Crop Yields Have Grown Steadily in the Last Six Decades

RESEARCH

Bitter vegetables have health benefits. What happens if scientists make them tastier?

In recent years, the aversion to eating bitter or pungent produce has prompted scientists to step up efforts to tweak the plants' DNA to reduce the enzymes that trigger these tastes. The result are less bitter mustard greens, sweeter pineapples, and other crop varieties that have recently entered the marketplace or are about to. But while alterations like these increase the produces' popularity, they also diminish their healthful effects.

Read full article...

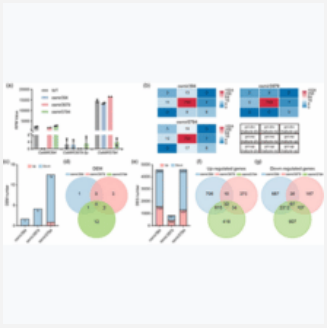
[Beans and gene editing]

[Hidden DNA in plants reveals secrets of photosynthesis]

[Researchers Develop Rust Resistant GM Wheat with Increased Heat Tolerance]

[CRISPR builds a big tomato that's actually sweet]

[Researchers Uncover New Gene Silencing Mechanism]



[Cas12a More Effective than Cas9 in Generating Knockout Mutants in MiRNA Genes in Rice]

From The Secretariat

[Exciting discussions at the FSII-NBPGR Roundtable on Fast Tracking Transboundary Seed Movement!]

[FSII Chairman, Mr. Ajai Rana At the Regen Ag Symposium 2024]

[FSII & NSAI hosted APSA 2025]

[FSII Chairman Mr. Ajai Rana at the Rural Voice - Agriculture Conclave and NACOF Awards 2024]

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For more information about Federation of Seed Industry of India visit www.fsii.in

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