



beej<sup>ki</sup>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.

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**FSII In News**



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

**FOOD FOR THOUGHT**

## Feeding 10 Billion

**RETHINKING AGRICULTURE WITH HIGH-YIELD, NUTRIENT-RICH SEED INNOVATIONS**

**G**rowing population is projected to reach 10 billion in the next 20 years, and increasing food production to meet this demand is a major challenge. To tackle this, innovative agricultural practices must evolve, leveraging modern technologies and sustainable methods to boost productivity without further exploiting resources. Precision, water-saving, and other advanced techniques are being adopted to optimize the use of fertilizers, which is crucial for increasing yields and ensuring food security. The need for sustainable food production is more urgent than ever, as unpredictable weather patterns, water scarcity, and reduced yields will place increasing pressure on farmers. A more holistic approach is required, one that not only optimizes the use of fertilizers but also integrates sustainable, affordable, and available solutions. This requires a shift in how we think about seeds, which need to be nutrient-efficient, emerging as a key innovation in promoting sustainable agriculture.

**Resource Efficient Seeds**  
The adoption of crops that are resource efficient is essential for the future of food production. For instance, water-efficient crop varieties can maintain high productivity even under the increasing threat of drought and extreme temperatures caused by climate change. In regions where water availability is already limited, these crops provide a lifeline for farmers. Similarly, crops that require fewer fertilizers and chemical inputs can significantly reduce the environmental impact of farming, particularly in countries like India, where fertilizer usage is among the highest in the world. In the 2020-21 fiscal year, India consumed more than 36.4 million metric tonnes of fertilizers, with subsidies accounting for 50% of the cost. The growing use of fertilizers to drive productivity comes with high economic and ecological costs. Nutrient-efficient crops which optimize the uptake and use of fertilizers, offer a way to reduce these negative effects, improving soil health and lowering input costs for farmers.

**Multi-Faceted Approach**  
India's agricultural challenges are vast, and a multi-pronged approach is needed to address them. Starting from the root, fundamental focus is on ensuring the quality of seeds. This is the most critical step in ensuring sustainable and high-yield agriculture. To fully unlock the potential of these innovations, government support is crucial. Policies that promote the adoption of nutrient-responsive and biofortified seeds through targeted subsidies and incentives will be key. Strategic public investment in research and development, collaboration between the private sector, research institutions, and farmers, will ensure that these advanced seeds reach all corners of the country, helping to drive agricultural growth.

**The Indian seed industry firmly believes that nutrient-efficient and resource-efficient seeds must play a pivotal role in achieving sustainable and high-yield agriculture.**

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**AGRICULTURE TODAY GROUP**

It is the need for nitrogen-efficient varieties, offering a glimpse into the potential for a more efficient agricultural future.

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

33 SPEAKING WITH



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SPEAKING WITH 33



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

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

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 superior attributes along with in-built basic and advanced stress resistance that can sustain 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 growing 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 B cotton hybrids, which significantly reduces insecticides and pesticide dependency, thus ensuring 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, the '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 struggles with issues like pest infestations (notably pink bollworm and CLCIV), soil degradation, water scarcity, and outdated agronomic practices, all of which hinder yield and economic viability for farmers. New losses require key inputs: pest- and disease-resistant varieties/hybrids, which are 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 these transformative technologies, ultimately strengthening the cotton industry and supporting India's agricultural resilience.

**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 exploration phase, concentrating on building expertise in gene editing technology. We plan to initiate projects once the regulatory issues are resolved. While gene editing technology is highly suitable to accelerate horticulture for research and development purposes, its licensing for commercial use poses significant challenges. Government support and subsidies for accessing this technology through controlled 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 (PVP), is essential to encourage investment and innovation in genetic 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 such a strong backdrop of a well-developed regulatory system, there is considerable experience in both approving and rejecting cotton events based on established criteria. For consistent 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 stronger, consensus-based 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 socio-economic risks and aligning with the regulatory standards in place.

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

Our collaboration with ICCR is on the 'Development of CLCIV-resistant Genetically Modified cotton' using elite multi-genepool resources and their cross derivatives. Additionally, ICCR 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 genetic 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, exclusive 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 CLCIV, 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 shown 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 Africa, for instance, there is a strong demand for drought-tolerant and pest-resistant 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 climate and local preferences. India's genetic engineering expertise can help these markets address yield challenges and pest issues, improving food and fibre security and meeting diverse needs. In these markets, strategic partnerships and localisation 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.

**Digital Horizons**  
digital.horizons.in

## 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

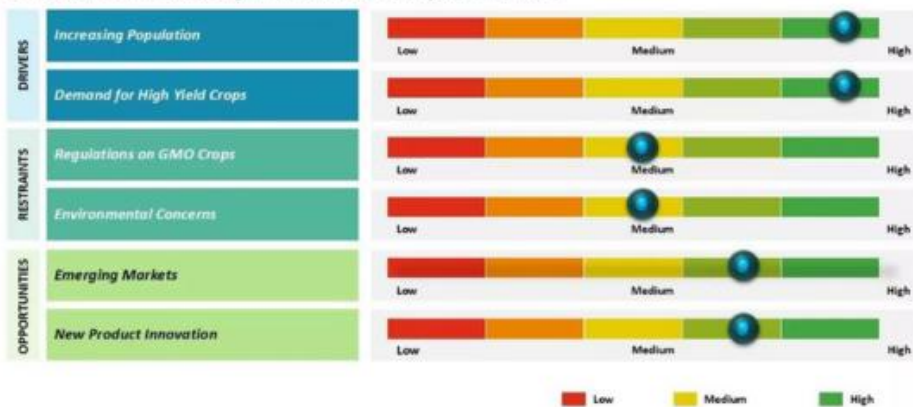


BHU scientists discover a natural method to protect maize crops from the destructive fungus

## GLOBAL

### Impact Analysis of Key Factors Global Genetically Modified Crops Market

COHERENT  
MARKET INSIGHTS



### 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](#)**

	COP29		EU Dereg		Timeline
Priority Metric?	Climate Plant Dev.	Category1	Category2	Timeline	Full Scale
EU Investment	Yes	No Labeling	Yes	Adapted to EU	Full Scale
COP29	Yes	Yes	Yes	Yes	Yes

	COP29		EU Dereg		Timeline
Priority Metric?	Climate Plant Dev.	Category1	Category2	Timeline	Full Scale
EU Investment	Yes	Yes	Yes	Yes	Yes
COP29	Yes	Yes	Yes	Yes	Yes

**[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](#)**

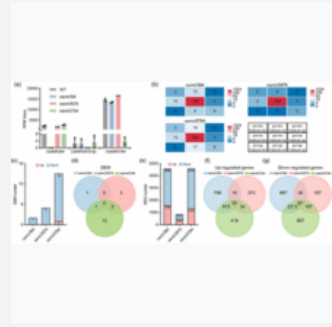




**CRISPR builds a big tomato that's actually sweet**



**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**



India takes center stage at the 2025 #APSA! It's an honor to witness the #FSII and #NSAI hosting this prestigious event, which is attracting over 600 participants from 300 seed companies. We've also met several rice companies from Southeast Asian countries and Pakistan. This is a testament to India's growing influence in the seed industry!  
#APSA2025 #India #FSII #Sustainability #Seed #Agricultureinnovation  
FSII - Federation of Seed Industry of India



Rural Voice Agriculture Conclave & NACOF Awards 2024  
Building Institutions for Farmers  
23rd December 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](http://www.fsii.in)

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