

## India

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**Neutral** (no change)

# Agribusiness

## GEs step forward but GMOs remain in limbo

- While Bt cotton is the only approved GMO crop, GE rice breaks through regulatory barriers bypassing transgenic restrictions.
- 2022 policy shift exempts non-transgenic gene-edited crops from GMO laws, unlocking the doors for GE rice, cotton, & even banana - a biotech revolution.
- Gene editing gives leeway to local seed firms, hit by policy limbo, aiding them to commercialize innovations in rice, pulses & oilseeds without GMO baggage.

### ICAR develops the world's first genome-edited rice varieties

- The Indian Council of Agricultural Research (ICAR) has developed the world's first genome-edited (GE) rice varieties using CRISPR-Cas SDN-1 technology.
- There are two GE varieties: 'Kamala' (IET-32072) and 'Pusa DST Rice 1' (IET-32043).
- 'Kamala' (IET-32072) is improved Samba Mahsuri (BPT-5204) with edited Gm1a gene using CRISPR-Cas12, having a higher yield (avg. 5.37t/ha, potential 9t/ha), gets matured in ~130 days (15–20 days earlier) and maintains original cooking quality.
- 'Pusa DST Rice 1' (IET-32043) is improved MTU-1010 (Cottondora Sannalu) with edited DST gene using CRISPR-Cas9, having enhanced drought & salinity tolerance, and a higher yield under stress (e.g., 3.508t/ha vs. 3.199t/ha under inland salinity).

### Why it should matter the most – there's policy failure despite the will

- Approved for commercial cultivation - Bt cotton (since 2002): The only GMO crop approved for commercial cultivation in India.
- Not approved (pending or blocked): 1) Bt Brinjal: Approved by the GEAC (Genetic Engineering Appraisal Committee) in 2009 but a moratorium was placed by the MoEFCC (Ministry of Environment, Forest and Climate Change) in 2010. 2) GM mustard (DMH-11) - Approved by the GEAC in 2022, but its commercial release has been held up due to litigation and strong opposition.

### Change in tactics

- The Indian government has relaxed rules for certain GE crops in Apr 2022.
- SDN-1 and SDN-2 gene-editing techniques (which do not involve insertion of foreign DNA) are exempt from GMO regulations.
- This is a landmark shift and it paves the way for genome-edited crops like drought-resistant or higher-nutrient varieties.
- Opens possibilities for GE use in oilseeds, pulses, and other crops.
- As per the GEAC, documents accessed by us show that GE cotton and GE banana are in the trial stage.

### Wings for Indian seed innovation

- We had asked seed companies (Figs.2 & 3) about their GE pipelines. Many expressed interest but felt constrained by hazy regulations. With GE exempt from GMO laws, these companies see a real opportunity in commercializing high-yield, stress-tolerant hybrids without transgenic hurdles. Hence, in our view, it reshapes the domestic seed industry.

**Research Analyst(s)****Nitin AWASTHI****T** (91) 22 4161 1550**E** nitin.awasthi@incredresearch.com**Figure 1: GE vs. GMO: What's the difference?**

Aspect	Genetically Engineered (GE)	Genetically Modified Organism (GMO)
<b>Definition</b>	Organisms whose DNA is precisely altered using biotechnology like CRISPR, gene silencing, or recombinant DNA techniques.	Broader term — includes any organism whose genetic material has been altered, including traditional crossbreeding, mutagenesis, and GE techniques.
<b>Techniques Used</b>	Advanced methods: CRISPR, RNA interference, and transgenesis.	Includes GE + older techniques like radiation/chemical mutagenesis.
<b>Regulatory Focus in India</b>	Treated like GMO if foreign DNA is involved.	Subject to full biosafety and environmental scrutiny.
<b>Public Perception</b>	Newer, precision-based, but still under scrutiny.	Long-standing controversy, especially around food crops.

SOURCE: INCRED RESEARCH, COMPANY REPORTS

Figure 1: Excerpts from Kaveri Seed Company's 4QFY23 earnings conference call



MAY 24, 2023

- Nitin Awasthi:** Got it, sir. And what about gene editing, which has been passed in China recently for soya, if I'm not wrong? That is a newer technology that is also available with everybody.
- Mithun Chand:** CRISPR technology is, again, that's a different one. And that does not come under GM crop. We are working on that. We are working with a company, but it will take some time.
- Nitin Awasthi:** Okay. So that you are working by ourselves, for ourselves?
- Mithun Chand:** So there are other companies are there. We are adding some sort of a tie-up, but it will take a longer time to get some seal off on that. But in traditional breeding and that marker-assisted breeding activity, we are having our own research, and we are able to get good hybrids in that. But that's a technology which we are already concentrating on.

SOURCE: KAVERI SEED COMPANY'S 4QFY23 EARNINGS CALL

Figure 2: Excerpts from Nath Bio-Genes (India)'s 2QFY24 earnings conference call

- Nitin Awasthi:** Okay, great, sir. This is just bookkeeping. Next question, sir, the government is pushing a lot of trust on carrying things right. If I'm -- if you could comment, are you seeing that happening? Are you seeing a lot of trust from different because a lot of departments are involved and this is still an evolving subject in India? However, are you seeing the government put its act together when it comes to GE crops in India, if you could comment on this?
- Devinder Khurana:** I'll ask Mr. Kagliwal.
- Satish Kagliwal:** Yes. Actually, momentum is shifting, let's say, emphasizing on genetically air crops. And I think every seed company is making an effort to get improved genetics and better products through this technology. And hopefully, this will speed up the process of new product development. And also, the kind of product that we can take out of this process will be different. The government message is there. But I think industry, which is putting them effort, is significantly now much more in the last few years than in the past.
- Nitin Awasthi:** Understood. Sir, last question from my side. I don't know whether you can answer this or not, so I'll just be asking you. And if you can answer, good. If you can't answer, I understand.
- Devinder Khurana:** Nitin, all your questions are too forward-looking, please ask.

SOURCE: NATH BIO-GENES (INDIA)'S 2QFY24 EARNINGS CALL

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## Recommendation Framework

### Stock Ratings

Definition:

- Add** The stock's total return is expected to exceed 10% over the next 12 months.
- Hold** The stock's total return is expected to be between 0% and positive 10% over the next 12 months.
- Reduce** The stock's total return is expected to fall below 0% or more over the next 12 months.

*The total expected return of a stock is defined as the sum of the: (i) percentage difference between the target price and the current price and (ii) the forward net dividend yields of the stock. Stock price targets have an investment horizon of 12 months.*

### Sector Ratings

Definition:

- Overweight** An Overweight rating means stocks in the sector have, on a market cap-weighted basis, a positive absolute recommendation.
- Neutral** A Neutral rating means stocks in the sector have, on a market cap-weighted basis, a neutral absolute recommendation.
- Underweight** An Underweight rating means stocks in the sector have, on a market cap-weighted basis, a negative absolute recommendation.

### Country Ratings

Definition:

- Overweight** An Overweight rating means investors should be positioned with an above-market weight in this country relative to benchmark.
- Neutral** A Neutral rating means investors should be positioned with a neutral weight in this country relative to benchmark.
- Underweight** An Underweight rating means investors should be positioned with a below-market weight in this country relative to benchmark.