MINUTES OF THE 161st MEETING OF GENETIC ENGINEERING APPRAISAL COMMITTEE HELD ON 14.07.2026

The 161st meeting of the Genetic Engineering Appraisal Committee (GEAC) of the Ministry of Environment, Forest and Climate Change (MoEFCC) was held on 14.07.2026 in hybrid mode at Godavari Hall, MoEFCC, New Delhi. The meeting was chaired by Dr. Amandeep Garg, Additional Secretary, MoEFCC, and Chairperson GEAC. The list of participants is placed at **Annexure 1**.

Agenda Item No. 1: Welcome of the Members

At the outset, Chairperson, GEAC welcomed all the members and Special Invitees. Members had a round of introduction.

Agenda Item No. 2: Confirmation of minutes of the 160th GEAC meeting

Minutes of the 160th GEAC meeting were circulated to all the members for comments, and the minutes were suitably amended to incorporate the comments received from the members.

Decision

Members confirmed the minutes of the 160th GEAC meeting.

Action: GEAC Secretariat

Agenda Item No. 3: Action taken report on the decisions taken in the 160th GEAC meeting

Member Secretary, GEAC briefed the committee on the action taken on the decisions taken in the 160th meeting of GEAC. The committee was informed that letters communicating GEAC decisions had been issued to the applicants, and all other concerned as required.

Decision

The Committee noted the actions taken by the Secretariat.

Action: GEAC Secretariat

Agenda Item No. 4: Application related to environmental release of GE Crops

4.1 M/s Mahyco Private Limited, Maharashtra for environmental release of Bollgard II Roundup Ready Flex (BGII™ RRF™) cotton incorporating events MON 15985 x MON 88913

The Committee was informed that the proposal of M/s Mahyco Private Ltd., Maharashtra for environmental release of BGII™ RRF™ cotton has been under consideration since the 145th GEAC meeting. *GEAC, in its 159th meeting held on 20.03.2026, deliberated in detail on the recommendations of the Expert Committee, the RARM plan, and the dossier. Keeping in view the precautionary principle, the GEAC*

recommended that the applicant may be advised to generate additional data as recommended by the Expert Committee under Indian Conditions, as per extant procedure and in accordance with the extant biosafety guidelines."

Accordingly, the applicant has submitted its responses along with the proposed draft study protocol titled "Protocol for effect of transgenic BGII-RRF™ cotton expressing *Cry1Ac, Cry2Ab* and *CP4 EPSPS* proteins and RRF cotton expressing *CP4 EPSPS* protein on soil microflora, nematodes, collembola and earthworms, and assessment of Bt and CP4 EPSPS proteins in soil".

Recommendation

After detailed deliberations, the Committee decided to forward the applicant's responses, along with the draft study protocol, to the same Expert Committee for detailed examination. The expert committee shall review applicant's responses and the draft study protocol and submit their recommendations to the GEAC Secretariat within 15 days.

Action: GEAC Secretariat

Agenda Item No. 5: Applications related to Confined Field Trials of GE crops (Event Selection Trials/ BRL-I/ BRL-II Trials)

5.1 M/s Ankur Seeds Private Limited, Nagpur, Maharashtra to conduct BRL-I (1st year) in north cotton growing zone and BRL-I (2nd year) trial in south and central cotton growing zones of GE cotton hybrids harbouring Event NBRI-PGK-519 expressing modified *mCry1EC* and GE cotton breeding stack hybrids containing Event NBRI-PGK-519×MON15985 expressing *mCry1EC, Cry1Ac* and *Cry2Ab* genes during Kharif 2026.

The Committee was informed that M/s Ankur Seeds Private Limited, Nagpur, Maharashtra has submitted a proposal seeking permission to conduct BRL-I (1st year) in north zone and BRL-I (2nd year) trial in south and central zones of GE cotton hybrids harbouring Event NBRI-PGK-519 expressing modified *mCry1EC* and GE cotton breeding stack hybrids containing Event NBRI-PGK-519×MON15985 expressing *mCry1EC, Cry1Ac* and *Cry2Ab* genes for resistance against Pink bollworm (*Pectinophora gossypiella*), American bollworm (*Helicoverpa armigera*) and Spotted bollworm (*Earias spp.*) during Kharif 2026 at total 14 trial site locations across north, central and south cotton growing zones viz., i) PAU, Bathinda, Punjab; ii) PAU, Faridkot, Punjab; iii) Kagdana, Sirsa, Haryana; iv) CCS HAU, Hisar, Haryana; v) Sanawad, Khargone, M.P., vi) RVSKVV, Khandwa, M.P.; vii) Nagpur, Maharashtra; viii) Chopda, Jalgaon, Maharashtra; ix) PDKV, Akola, Maharashtra; x) VNMK, Parbhani, Maharashtra; xi) Siripuram, Guntur, A.P.; xii) ANGRAU, Lam, Guntur, A.P.; xiii) Atmakur, Warangal, Telangana and xiv) UAS, Raichur, Karnataka.

The proposed objectives of the BRL-I trial are:

1. **Genetic Stability & Molecular Validation**:

Confirm stable expression of Cry1Ac, Cry2Ab, and mCry1Ec genes using PCR and ELISA-based assays.

Ensure trait integrity in stacked hybrids over generations.

2. **Agronomic Performance:**

   Record key agronomic traits

   To assess fiber properties

3. **Trait efficacy studies:**

   Trait efficacy against Pink Bollworm, Spotted Bollworm, and American Bollworm.

4. **Environmental safety studies:**

   Weediness and aggressiveness potential

   Assessment of effects of GE plants on soil microorganisms

   Study on pests/diseases and beneficial organisms

5. **Food and Feed Safety Studies:**

   To generate produce needed for food and feed safety assessments to conduct compositional studies with stacked event NBRI-PGK-519 X MON15985, single event NBRI-PGK-519, non-Transgenic hybrid in North, Central and South zone.

6. **Crossability Studies:**

   Intraspecies crossability: To check pollen-mediated gene flow from transgenic cotton event NBRI-PGK-519 expressing mCry1EC protein to non-transgenic cotton under confined field trial during Kharif 2026

   Interspecies crossability: To study crossability of the transgenic cotton with closely related species. The trial will include Event NBRI PGK 519, Breeding Stack NBRI PGK 519×MON15985 and lines of *G. arboreum*, *G. herbaceum* and *G. barbadense* during Kharif 2026.

Earlier, this proposal for conduct of BRL–I 1st year was considered in 156th GEAC meeting held on 14.07.2025 under Agenda item 4.2 and GEAC recommended to conduct trials at two trial sites i). Khargone, Madhya Pradesh and ii). Guntur, Andhra Pradesh during Kharif 2025.

The present proposal was considered and deliberated upon during the 338th meeting of the Review Committee on Genetic Manipulation (RCGM) held on 24.06.2026. Subsequently, the RCGM, vide its letter dated 30.06.2026, forwarded the recommendations of the 338th meeting and recommended the proposal to the GEAC for further consideration.

The applicant has submitted No Objection Certificates (NOCs) from the State Governments of Madhya Pradesh, Haryana, Andhra Pradesh, Karnataka, and Punjab.

Recommendations:

GEAC deliberated on the proposal. Based on the recommendation given in 338th RCGM meeting, the proposal of M/s Ankur Seeds Private Limited, Nagpur,

Maharashtra to conduct BRL-I (1st year) in north zone and BRL-I (2nd year) trial in south and central zones of GE cotton hybrids harbouring Event NBRI-PGK-519 expressing modified *mCry1EC* and GE cotton breeding stack hybrids containing Event NBRI-PGK-519×MON15985 expressing *mCry1EC, Cry1Ac* and *Cry2Ab* genes for resistance against Pink bollworm (*Pectinophora gossypiella*), American bollworm (*Helicoverpa armigera*) and Spotted bollworm (*Earias spp.*) during Kharif 2026 was recommended by the committee at the following sites;

i. Kagdana, Sirsa, Haryana;
ii. CCS HAU, Hisar, Haryana;
iii. Sanawad, Khargone, M.P.,
iv. RVSKVV, Khandwa, M.P.;
v. Siripuram, Guntur, A.P.;
vi. ANGRAU, Lam, Guntur, A.P.;
vii. UAS, Raichur, Karnataka;
viii. PAU, Bathinda, Punjab;
ix. PAU, Faridkot, Punjab;

The recommendation is subject to following conditions:

i. The applicant shall adhere to the conditions of RCGM letter dated 30.06.2026.
ii. The applicant shall adhere with the conditions and/or recommendations mentioned in concurrence obtained from Government of Madhya Pradesh vide letter dated 02.12.2025; Government of Andhra Pradesh vide letter dated 31.12.2025; Government of Haryana vide letter dated 30.01.2026; Government of Karnataka vide letter dated 18.06.2026 and Government of Punjab vide letter dated 08.07.2026.
iii. The BRL-I confined field trials should be conducted at insect specific hotspot in the trial sites that are appropriate to evaluate the introduced insect resistant trait in the GE plant.
iv. The applicant shall share details of the trial site as required under part G of the Guidelines and SOPs for Confined Field Trials of regulated GE plants, 2008 including ownership of trial site.
v. The applicant shall share information regarding confirmed availability of isolation distance, land use and its ownership, before start of the trial.
vi. The applicant shall share information regarding name of the trial-in charge/lead scientist responsible for each trial, as well as expected date of sowing, before start of the trial.
vii. Upon successful completion of intended BRL-I 1st year and 2nd confined field trials, the findings/ report of these BRL-I trials should be reviewed by RCGM.

RCGM may issue the permit letters and monitor confined field trials to ensure compliance of prescribed terms and conditions. The permit letter shall, inter-alia, mention the constitution and Terms of Reference of Central Compliance Committee, including participation of State Government representative therein. The permit letter, for confined field trial site, to be issued under intimation to the concerned State Government.

Action: RCGM and GEAC Secretariat

Agenda Item No. 6: Applications related to Environmental Approval of clinical trials/ pharmaceuticals / veterinary drugs and Commercial Production

6.1 M/s Invati Creations Pvt. Ltd. for production Scale-Up of Recombinant Lactobacillus plantarum NC8-Based Oral Probiotic Against Salmonella in Poultry

The applicant submitted an application on 12.11.2025 seeking approval for the production of 10 tonne per year of Recombinant *Lactobacillus plantarum* NC8-Based Oral Probiotic Against *Salmonella* in Poultry.

The recombinant *Lactobacillus* strain expresses *Salmonella* antigens via pTRK892 vector containing the pgm promoter, Signal Lp_2145, and cAM12 anchor sequences. The probiotic induces both mucosal IgA and systemic IgG responses and provides 95% protection against lethal *Salmonella* challenge.

The RCGM, in its 269th meeting held on 18.10.2023, considered and noted the application submitted by Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir (SKUAST-K), Ganderbal, Jammu and Kashmir, to carry out research and development work on recombinant *Lactobacillus* vaccine against *Salmonella typhimurium* in poultry. Accordingly, RCGM Letter No. BT/IBKP/399/2020 dated 31.10.2023 was issued to the University**.**

The applicant, vide email dated 21.05.2026, submitted the report of the contained poultry trial results of the Development and Evaluation of a Recombinant *Lactobacillus plantarum*-Based Oral Vaccine Against *Salmonella* in Poultry.

Recommendations

After detailed deliberations, the committee decided to forward the application, along with the submitted report of the contained poultry trial results of the Development and Evaluation of a Recombinant *Lactobacillus plantarum*-Based Oral Vaccine Against Salmonella in Poultry, to RCGM for consideration.

Action: GEAC Secretariat

Agenda Item No. 7: Applications related to Import/Export

7.1 Guidelines for processing applications for Production, Import and Sale of Animal Feed containing or derived from GMOs

Since 2017, the GEAC has been receiving applications for the import of DDGS produced from GMOs, as well as for the domestic production and sale of DDGS in India. Accordingly, GEAC in its 131st meeting dated 13.01.2017 constituted a sub-committee under the chairmanship of Prof. K. Veluthambi to prepare draft guideline with a prescribed application form**.**

Subsequently, in the 135th GEAC held on 25.07.2018, GEAC decided to develop a uniform procedure and application format for processing applications relating to GM animal feed, including DDGS, and entrusted the task to a Sub-Committee under the Chairpersonship of Dr. Lalitha R. Gowda, Former Chief Scientist, CFTRI and Member, GEAC.

In 138th GEAC meeting dated 11.11.2019, the sub-committee submitted the below mentioned draft documents.

i. Procedures for handling applications on import of animal feed containing or derived from genetically modified organisms (GMOs)/ living modified organisms (LMOs)
ii. Application Form
iii. Production, processes, uses and safety of Dried Distillers Grains with Solubles (DDGS) for animal feed.

GEAC in its 156th meeting held on 14.07.2025 recommended the sub-Committee to revise the previously prepared draft documents by incorporating the subsequent scientific advances and changes in the extant regulatory framework, the Sub-Committee under the Chairpersonship of Dr. Lalitha Gowda, Former Chief Scientist, CFTRI, was tasked with preparing guidelines and procedures for processing applications relating to the production, import and sale of animal feed containing or derived from GMOs.

The Sub-Committee submitted draft *Guidelines for processing applications for Production, Import and Sale of Animal Feed containing or derived from Genetically Modified Organisms (GMOs).*
Considering the expertise of RCGM in developing biosafety-related guidelines, SOPs, and procedures for handling GMOs/LMOs, RCGM was requested to finalize the *"Guidelines for processing applications for Production, Import and Sale of Animal Feed containing or derived from GMOs"* in consultation with all relevant stakeholders, including FSSAI, DAHD, ICAR, DoF, DGFT, and DPPQS and submit the same to GEAC.

RCGM vide email dated 29.04.2026, has shared finalized "Guidelines for Processing of Applications for Import, Sale, and Domestic Production of Animal Feed containing or derived from Genetically Modified Organisms (GMOs). The guidelines classify applications into (a) Scope 1**:** Feed containing or derived from one or more GMO(s) where the end product contains OR may contain viable GM material; and (b) Scope 2: Feed derived from GM plants or GM microbial fermentation processes where no viable GM material remains in the end product. RCGM also shared the document for policy decisions to be taken by GEAC/MOEFCC based on inputs received from concerned agencies.

Biosafety Support Unit (BSU) of RCGM made a detailed presentation on the Guidelines for Processing of Applications for Import, Sale, and Domestic Production of Animal Feed containing or derived from Genetically Modified Organisms (GMOs).

Recommendations

Following detailed deliberations, the Committee decided that the draft guidelines be circulated to the Members and Special Invitees of the GEAC for examination. The matter would be placed in the upcoming GEAC meeting for further deliberation and appropriate decision.

Action: GEAC Secretariat

Agenda Item No. 8 : Any other Item with the permission of Chairman

M/s Rasi Seeds P Ltd, Salem, Tamil Nadu for change in the location from Masaipet, Telangana to Kurnool, Andhra Pradesh, while utilizing the existing No Objection Certificate (NOC) for Andhra Pradesh and change in the protocol for Crossability (interspecific and intraspecific) and Pollen Flow studies

The proposal of M/s Rasi Seeds Pvt. Ltd, Salem, Tamil Nadu to conduct the BRL-I 2nd year trial of GE cotton hybrids harbouring event RIRC-304 expressing *cry1C gene* and GE Cotton breeding stack of events RIRC-304×MON15985 expressing *cry1C, cry1Ac* and *cry2Ab2* genes for resistance against bollworm complex (i.e., *Pectinophora gossypiella*, *Helicoverpa armigera* and *Spodoptera litura*) was considered and recommended by the GEAC in its 160th meeting held on 29.05.2026 at six trial site locations during Kharif-2026 under agenda 4.2.

Due to non-availability of No Objection Certificate (NOC) for Telangana, the applicant intends to change the location from Masaipet, Telangana to Kurnool, Andhra Pradesh, while utilizing the existing No Objection Certificate (NOC) for Andhra Pradesh and change in the protocol for Crossability (interspecific and intraspecific) and Pollen Flow studies with the same cotton hybrids.

The proposal was considered and deliberated upon during the 337th meeting of the Review Committee on Genetic Manipulation (RCGM) held on 10.06.2026. Subsequently, the RCGM, vide its letter dated 18.06.2026, forwarded the recommendations of the 337th meeting and recommended the proposal to the GEAC for further consideration.

Recommendations

After detailed deliberations, the committee recommended changing the study location from Masaipet, Telangana to Kurnool, Andhra Pradesh, utilizing the existing No Objection Certificate (NOC) issued for Andhra Pradesh to conduct the Crossability (interspecific and intraspecific) and Pollen Flow studies, as recommended by RCGM.

RCGM may issue the permit letters and monitor the trials to ensure compliance of prescribed terms and conditions. The permit letter shall, inter-alia, mention the constitution and Terms of Reference of Central Compliance Committee, including

participation of State Government representative therein. The permit letter, for confined field trial site, to be issued under intimation to the concerned State Government.

Action: GEAC Secretariat

The meeting ended with a vote of thanks to the Co-Chair and all the Members.

Annexure 1

List of Participants

Members who participated			
1	**Shri Amandeep Garg** **Chairman** Additional Secretary, MoEFCC, Indira Paryavaran Bhawan, Jor Bagh road, Aliganj, New Delhi- 110003	**9**	**Prof. (Dr.) Unnat P. Pandit** **Member** Controller General of Patents, Designs & Trade Marks (CGPDTM)
2	**Dr. Nitin K. Jain** **Co-Chairman** Scientist-G, Department of Biotechnology, Block 2 CGO Complex, Lodhi Road, New Delhi - 110 003	**10**	**Dr. D. K. Yadava** **Member** ADG, (Crop Science) Indian Council of Agricultural Research, Krishi Bhawan, New Delhi-110001
3	**Sh. Tarun Kumar Kathula** **Vice-Chairman** Scientist G, MoEFCC, Indira Paryavaran Bhawan, Jor bagh, Aliganj, New Delhi- 110003	**11**	**Dr. Ruchi Singh** **Member** Scientist-G and Head, Discovery Research Division, ICMR Headquarters, New Delhi
4	**Dr. Satish Wate** **Member** Former Director, CSIR-National Environmental Engineering Research Institute (NEERI) Nagpur- 440020	**12**	**Dr. Prabodh Trivedi,** **Member** Director, CSIR- CIAMP Lucknow - 226015
5	**Prof. (Dr.) U. S. N. Murthy** **Member** Director, National Institute of Pharmaceutical Education and Research, Guwahati-781 101	**13**	**Dr. Tanu Jain, Director,** **Member** National Center for Vector Borne Diseases Control (NCVBDC), New Delhi

6	**Dr. Chaitanya Joshi** **Member** Director, Gujarat Biotechnology Research Centre, Gandhinagar, Gujarat- 382 011	14	**Dr. J.P. Singh** **Member** Plant Protection Adviser Directorate of Plant Protection, Quarantine & Storage, NH IV, Faridabad-121001. Delhi Office: Room No. 409, 'B' Wing, Shastri Bhawan, New Delhi
7	**Dr. Anand D. Ballal,** **Member** Scientific Officer H & Head, Nuclear Agriculture & Biotechnology Division, BARC, Trombay, Mumbai	15	**The Chairman,** Central Pollution Control Board (CPCB) **Member**
8	**Dr. Naveen C. Bisht,** **Member** Scientist-VI, National Institute of Plant Genome Research (NIPGR)	16	**Dr. Abhilasha Singh Mathuriya** **Member Secretary,** Scientist D, CS-III Division, Ministry of Environmen t, Forest and Climate Change, Jor bagh , New Delhi-110003
	Special Invitees		
1	**Dr. Pranjali Vishwakarma** Scientist, BSU	8	**Dr. Lokendra Kumar** Joint Director, FSSAI
2	**Dr. Shipra Shahi** Scientist, BSU	9	**Mrityunjay Anand** Technical Officer, FSSAI
3	**Dr. Ani Bency Jacob** Asst. Commissioner, DAHD	10	**Artabandhu Sahoo** Director, ICAR-NIANP, Bengaluru
4	**Dr. Celia Chalam Vasimalla** Head, Division of Plant Quarantine, ICAR-NBPGR, Pusa Campus, New Delhi	11	**Dr. Nilesh Anil Pawar** Deputy Director (Aquatic Quarantine) Representative of FDC, Department of Fisheries
5	**Dr. Monika Singh** Sr. Scientist, Division of Genomic Resources, ICAR-NBPGR, Pusa Campus, New Delhi	12	**Dr. Anoop A. Krishnan** Assistant Director (Technical) Export Inspection Council (EIC), Ministry of Commerce & Industry, Government of India.
6	**Dr. A. K Mohanty** Director, ICAR-CIRC, Meerut	13	**Dr. Vinay Kumar** Assistant Director (Tech), EIA-KOCHI, Laboratory
7	**Smt. Suneeti Toteja** Scientist F & Head (FAD), BIS		

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