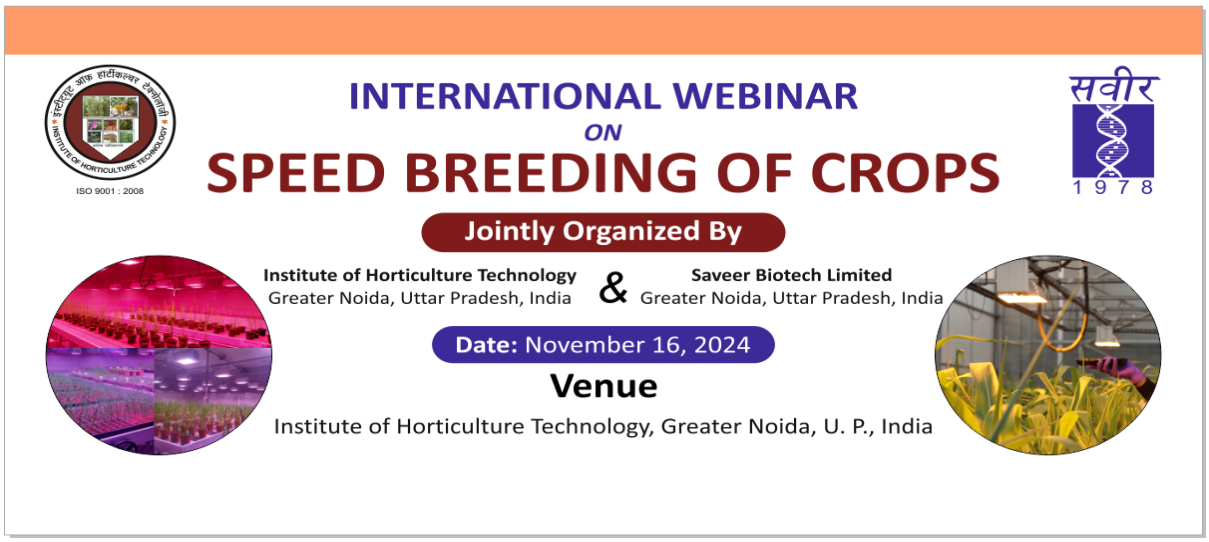
# Proceedings of the One-Day International Webinar on Speed Breeding of Crops

***Organized by the Institute of Horticulture Technology (IHT) in Collaboration with Saveer Biotech Limited***

***16th November 2024 | Greater Noida, Uttar Pradesh, India***




Institute of Horticulture Technology in Collaboration with Saveer Biotech Limited organized International Conference -Webinar on 16th Nov.2024 at Greater Noida, U.P. This webinar received overwhelming response. The webinar delved into the transformative potential of speed breeding and how international collaboration and technological innovation can drive progress and sustainability in agriculture. The webinar received overwhelming response with over a hundred delegates participating in the event.

Leading experts explained about the cutting-edge topics in speed breeding in the themed sessions featuring presentations, panel discussions, and Q&A on various aspects of speed breeding. The specialty of this webinar was that there was a virtual tour conducted by an expert Dr. Dharmendra Bhatia, a Senior Breeder, Dept. of Biotechnology PAU, Ludhiana, Punjab of the Speed Breeding facility that has been established in Punjab Agricultural University, Punjab.

**Inaugural Session**

**Dr. R. S. Kureel**, Director IHT, welcomed attendees, stressing the urgency of climate-resilient crops for food security. Notable addresses included:

1. **Dr. A.K. Singh**, Vice Chancellor, RLB Central Agricultural University:
    a) Highlighted speed breeding's potential to reduce breeding cycles from years to months.
    b) Emphasized interdisciplinary collaboration for sustainable agriculture.
2. **Dr. Sudhakar Pandey**, ADG (Horticulture), ICAR:
    a) Outlined ICAR's initiatives integrating speed breeding with genomics and molecular markers.
    b) Advocated for public-private partnerships to scale innovations.

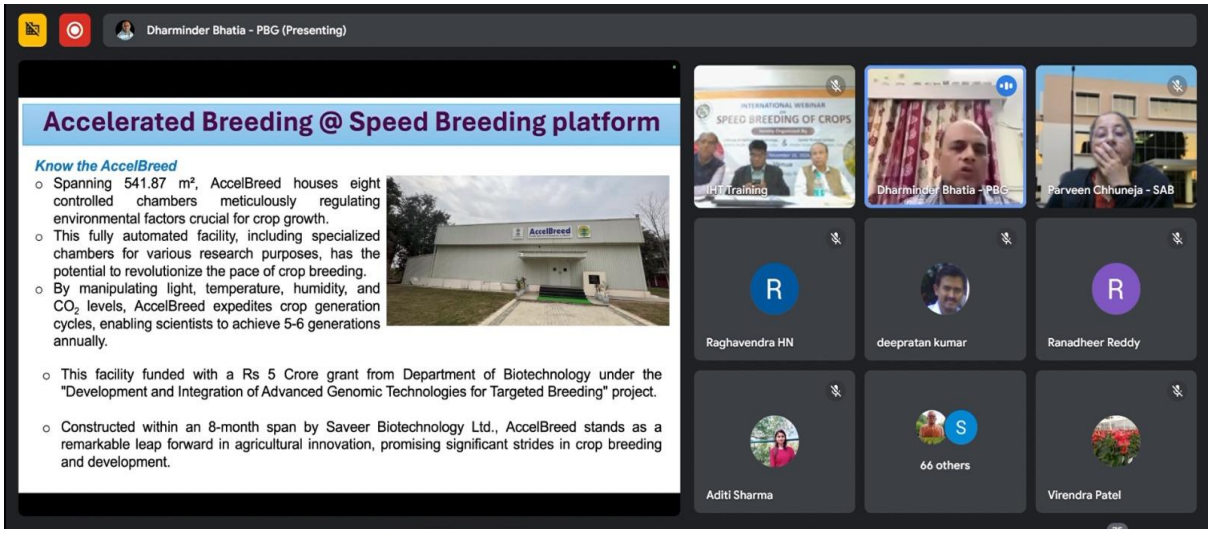
**Technical Sessions**

**Session 1: Varietal Development Using Speed Breeding**

*Chaired by **Dr. Praveen Chhanneja** (Director of the Department of Biotechnology at Punjab Agricultural University (PAU), Ludhiana), Rapporteur: **Dr. Vijay K. Koul** (Associate Director, IHT Greater Noida)*

1. **Dr. Uma Maheshwar Singh** (Senior Breeder, IRRI, Varanasi, UP):
    a) Demonstrated rice breeding cycles reduced to 1–2 years via optimized photoperiods (20–22 hours) and light spectra.
    b) Stressed the role of speed breeding in preserving genetic diversity amid climate volatility.
2. **Dr. Dharmendra Bhatia** (Senior Breeder, Dept. of Biotechnology PAU, Ludhiana, Punjab):
    a) Showcased PAU's 8-climate-chamber facility enabling 6 generations/year for wheat/rice.
    b) Addressed cost challenges and proposed polyhouse conversions for affordability.
3. **Dr. S. Manonmani** (Professor and Head of the Department of Rice at the Centre for Plant Breeding and Genetics (CPBG), TNAU, Coimbatore):
    a) Reported 50% reduction in breeding time (4→2 years) for rice using controlled environments.
    b) Highlighted synergies between speed breeding and marker-assisted selection.
4. **Dr. Pathik Patel** (Head of the Department of Genetics and Plant Breeding at Navsari Agricultural University, Navsari):
    a) Advocated automation and LED systems to streamline speed breeding for chickpea and sugarcane.

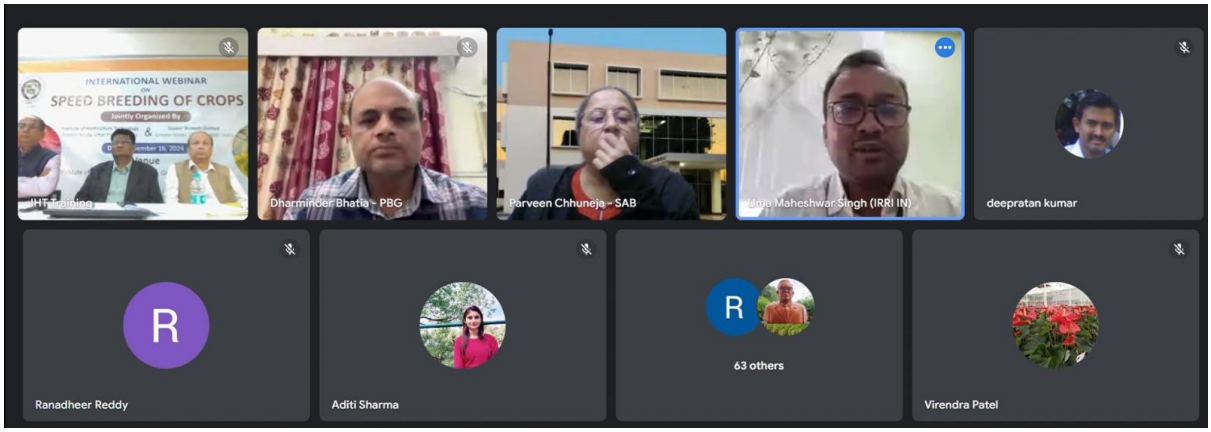
*Q&A:* Discussions covered protocol standardization, cost-sharing models, and inter-institutional collaboration.



**Session 2: Innovations and Infrastructure**

*Chaired by Dr. R. S. Kureel (Director, IHT), Rapporteur: Dr. Neha Pandey (Senior Biotechnologist, IHT, Greater Noida)*

1. **Er. Sanjay Sudan** (Director, Saveer Biotech):
    a) Detailed Saveer's role in establishing speed breeding facilities at IRRI, NABI, and TNAU.
    b) Announced plans to integrate global cutting-edge technologies.
2. **Dr. Anil Khar** (Head, Regional Research station, IARI, Pune, Maharashtra):
    a) Shared breakthroughs in onion breeding using double haploidy and molecular markers.
3. **Dr. Umesh Kohli** (Retd. Dean Dr. YSR University, Solan):
    a) Proposed AI and robotics to enhance phenotyping in speed breeding for vegetables.




**Session 3: Policy and Future Directions**

*Chaired by **Dr. R. K. Trivedi** (Executive Director, National Seed Association of India (NSAI), New Delhi), Rapporteur: **Dr. Virendra Patel** (Senior Scientist, IHT, Greater Noida)*

1. **Dr. Neha Pandey (**Senior Biotechnologist, IHT, Greater Noida**):**
    a) Outlined IHT's training programs to operationalize speed breeding facilities and the scope of having Public – Private Collaboration for crop improvement for food security.
    b) Proposed IHT's collaborating with stakeholders, including seed companies, research institutes, and universities as the Institute can co-develop and refine speed breeding protocols, ensuring the adoption of best practices tailored to specific crops
2. **Dr. R. K. Tripathi** (Retd., Director Seeds Ministry of Agriculture and Farmers Welfare, GOI):
    a) Urged policy reforms to boost GM crop adoption and public-private R&D sharing.

**Virtual Tour**

**Dr. Dharmendra Bhatia (PAU)** led a tour of PAU's facility, showcasing:

- Climate-controlled chambers enabling 6 wheat/rice generations annually.
- Strategies to mitigate high operational costs (e.g., hybridizing with traditional breeding).

**Valedictory Session**

**Dr. S. K. Malhotra**, Vice Chancellor (MPHU, Karnal), concluded:

- Speed breeding is critical for pulses and staple crops to reduce import dependency.
- Called for institutionalizing speed breeding protocols across crops.

**Dr. Vijay K. Koul (IHT)** expressed sincere thanks to all speakers, panellists and participants for making the webinar on Speed Breeding of Crops a success. He specifically acknowledged the Chief Guest, **Dr. A.K. Singh**, Vice Chancellor of RLB Central Agricultural University, for his inspiring inaugural address, as well as **Dr. Sudhakar Pandey** (ICAR) for his keynote on speed breeding's role in global food security.

He also highlighted **Dr. S.K. Malhotra**'s valedictory address, emphasizing collaborative efforts to tackle agricultural challenges.

**Dr. Kureel**, Director of IHT, concluded by expressing optimism that the webinar's discussions would lead to fruitful collaborations and innovations in speed breeding, advancing sustainable agriculture

**Key Outcomes**

1. **Technology:** Speed breeding slashes varietal development time by 50–70% via controlled environments.
2. **Collaboration:** Universities, ICAR, and private sectors must unite to standardize protocols.
3. **Policy:** Lower regulatory barriers for GM crops and incentivize infrastructure investments.
4. **Scalability:** Explore cost-effective adaptations (e.g., polyhouses) for wider adoption.

**Acknowledgements**

The organizers thanked IHT R&D teams, Saveer Biotech's technical support, and all delegates for fostering a collaborative roadmap to revolutionize crop breeding