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RESEARCH SPECIALIZATION:

Biotechnology & Molecular Biology,
Plant tissue culture, Genetic engineering & Molecular Biology.

Academic Qualifications

Ph. D. Genetics (1984)

M.Sc. Botany (1978)

B.Sc. Biology (1976)

Rockefeller Foundation Post doctoral Fellow, USA (1992-94)

Positions held:

Assistant Scientist/ Assistant Professor (1983-1997)

Scientist/Associate Professor (1997-2007)

Senior Scientist/Professor (2007-till date_

Awards:

1. Awarded National Merit Scholarship by Govt. of India during 1972-1976 for undergraduate study
2. Awarded HAU merit fellowship during M.Sc.Botany during 1976-1978.
3. Awarded Department of Atomic Energy (DAE), Govt. of India, JRF(A), JRF(B) and SRF during Ph.D. programme (1979-1983).
4. Awarded Rockefeller Foundation, USA, Post- Doctoral Fellowship on rice biotechnology for development of transgenic insect resistant rice at Michigan State University, East Lansing, USA from Oct. 1992-1994.
5. Awarded certificate of honor by CCS HAUTA for bringing projects from Outside agencies in 2007.
6. Presentation of research by my students in National conference on 'Physiological and biotechnological approaches to improve plant biotechnology' organized from 15-17 March, 2008 at Centre of Plant Biotechnology, Hisar. **One oral paper was adjudged Best oral presentation** (P. Sharma *et al.*) Another poster presentation was adjudged as **the Best poster** (Aditi *et al*)

Projects completed:

1. Somatic cell hybridization and Androgenesis in crop plants. (C (a) **Genet.-2 NP-Agril., Haryana State Govt.**).
2. Application of molecular and genetic engineering techniques for crop improvement. (C (a) **BMB-2 NP-Agril., Haryana State Govt.**).

3. Use of Tissue culture techniques in the improvement of rice crop (**ICAR, 1986**)
4. Assessment of somaclonal variation in regenerated plants of Date palm (**ICAR, 1988; Co-investigator**).
5. Genetic improvement of rice through Biotechnological techniques; Sub-Proposal I: Wide Hybridization (**The Rockefeller Foundation, USA, 1992; Co-investigator**).
6. Development of transgenic Basmati rice through biotechnology (**The Rockefeller Foundation, USA, 1995; Principal Investigator**)
7. Development of Transgenic plants of Chickpea through the use of Biotechnological techniques (**DBT, 1992; Co-investigator**).
8. Factors affecting Karnal bunt (*Neovossia indica*) resistance in Wheat (**NATP,CGP mode, ICAR,2001; Co-investigator**).
9. Development of Improved cotton genotypes for insect resistance through biotechnology (**NATP, Mission Mode ICAR, 2002; Principal Investigator**).
10. Engineering *Brassica juncea* (L.) Coss & Czern. Resistant to *Alternaria* blight (**NATP, CGP mode, ICAR, 2002; Co-Principal Investigator**).
11. Development of Cotton using *cry* genes from native BT strains (**C(b)BMB-Plan 3; Pricipal Investigator**).
12. Cloning of novel transcription factors from Brassica species which have role in early signaling for drought and salinity tolerance” (DBT project 2005-2008; **Co-Principal Investigator**)

Peer Recognition

- Fellow, Indian Society of Genetics and Plant Breeding
- International Association of Plant Tissue Culture
- Tissue Culture Association
- Society of Biological Chemists
- Society of Biochemistry and Plant Biotechnology
- Expert member, paper setter and evaluation of post graduate theses and selection of SRF/RA etc. from various universities.
- Best poster presentation award for Chlorophytum tissue culture in “National seminar on Research and developments in production, protection, quality, processing and marketing of medicinal and aromatic plants”, CCS HAU, 27-29 Feb., 2004.
- Invited for oral presentation on Date Palm micropropagation at 2nd International Conference on Datepalm in Al Ain, UAE, 2000.
- DBT nominee in Institutional Biosafety committee (IBSC) of Maharishi Dayanand University (MDU), Rohtak, Haryana.

- Member expert, selection committee, Biotechnology Consortium of India Limited (BCIL) under DBT for three years (2008-2010).
- Brassica *myb* cDNA sequence deposited in NCBI database (EU233274).

Teaching

Involved in undergraduate and postgraduate teaching in the Department (Introductory plant biotechnology, Genetic engg., Advanced plant Genetic Engg., Plant cell and Tissue culture, Biotech., environment and Society)

Trainings

- a) Practical course on “ **Methods in Genetic engineering of plants**” Michigan State University, East Lansing, USA, September 1992-Jan.1993.
- b) **4th Computer Appreciation Course** from July 17-August 3, 1995
- c) Training on “**Enzyme linked immuno-assays in Vety. Microbiology**” organized by the Department of Vety. Microbiology, CCS HAU, Hisar, March 7, 1997-March 17, 1997.
- d) Training course on “**Genomic library construction and screening**” organized by Centre for Advanced Studies (CAS), Department of Biochemistry, IARI, New Delhi from March 30, 2001-April 19,2001.
- e) Refresher course on “ **WTO in relation to Indian economy: Challenges and Opportunities**” organized by Academy of Agricultural Research and Education Management (AAREM), Directorate of Human Resource Development, CCS HAU, Hisar from August 7, 2002- August 27, 2002.
- f) Commendation certificate from HAUTA, CCS HAU, Hisar for bringing research project on **Genetic Improvement of Basmati rice from the Rockefeller Foundation** of USA in 1996.
- g) Commendation Certificate from HAUTA, CCS HAU, Hisar for bringing research project on, “ **Development of Transgenic plants of Chickpea.**” from **Department of Biotechnology (DBT), N. Delhi.** in 1996.
- h) **University level presentation on BT Cotton as organized by Dr. BS Dahiya, Director of Research, CCS HAU, Hisar.**
- i) Attended and participated in NATP-MM review with World Bank experts.

- j) Attended and delivered lecture in National seminar on Emerging environmental issues and technological challenges, GJU, Sept.1-2, 2003.
- k) Attended National seminar on Research and developments in production, protection, quality, processing and marketing of medicinal and aromatic plants, CCS HAU, 27-29 Feb., 2004.
- l) Attended refresher course on Research Management, 23rd May-12th June, 2007. Directorate of Human Resource management, CCS Haryana Agril. University, Hisar.
- m) Attended Winter School on 'Intellectual property and its management in Agriculture', 28th November-18th December, 2007, IPR cell, Directorate of Human Resource management, CCS Haryana Agril. University, Hisar.

Conferences/symposium attended

International

- International Symposium on Cell culture in crop improvement, Calcutta, Dec. 6-10, 1981.
- International Congress of Genetics, New Delhi, 1983.
- 2nd Rice Genetics Symposium, Los Banos, IRRI, Phillipines, May 12-16, 1990.
- 4th Annual meeting on International program on rice biotechnology sponsored by the Rockefeller Foundation, USA in Los Banos, IRRI, Phillipines, May 9-12, 1990.
- 5th Annual meeting on International program on rice biotechnology sponsored by the Rockefeller Foundation, USA in Tuscon, Arizona, USA, Oct.2-5, 1991.
- International society of Plant Molecular Biology meeting in Tuscon, Arizona, USA, Oct.6-8, 1991.
- 7th Annual meeting on International program on rice biotechnology sponsored by the Rockefeller Foundation, USA in Bali, Indonesia, May 16-20, 1994.
- Annual meeting of Tissue Culture Association (TCA), Research Triangle Park, North Carolina. USA, June 4-7. 1994.
- Third Annual meeting of Agricultural Biotechnology for Plant productivity (ABSP) sponsored by USAID, Michigan State University, East Lansing, USA. August, 1994.
- 3rd Rice Genetics Symposium, International Rice Research Institute (IRRI), Manila, Phillipines, 16-20, September, 1995.
- International Conference on Sustainable Agriculture and Environment, CCS HAU, Hisar, Jan, 1995.
- 8th Annual meeting on International program on rice biotechnology sponsored by the Rockefeller Foundation, USA, Malacca, Malayasia, Sept. 15-19, 1997.
- Agricultural technology moving California into the 21st century, California Plant and Soil conference 1999. Visalia Jan 20-21.

- 2nd International Conference on Date Palms, Al-Ain, UAE, March 25-28, 2000.

National:

- National Seminar on Plant Physiology, Hisar, 1983.
- National Symposium on Recent Advances in Plant Cell and tissue cultures of economically important plants, Hyderabad, 1987.
- 2nd National Group meeting on rice biotechnology, Directorate of Rice Research, Hyderabad, Nov.18-19, 1992.
- Attended 4th National Rice Biotechnology Network meeting held at NCL,Pune, July 4-6,1995.
- Participated in National Symposium on Newer perspectives in environmental mutagenesis and carcinogenesis. Jan.19-21, 1995, held in HAU Hisar
- Participated in National Symposium on Current Trends in Plant Biochemistry & Biotechnology held at CCS HAU Hisar from February 23-25,1996.
- Attended Fifth National Rice Biotechnology Network meeting from November 13-16,1996 in ICGEB, New Delhi.
- Participated in All India Biotech Association's Brain Storming session on Priorities for Biotechnology sector on 20th December, 2000 at Chandigarh.
- National Symposium on New opportunities and challenges for improving crop productivity through biotechnology, CCS HAU, Hisar, Feb.13-15, 2002.

Post graduate students guided/ working

M.Sc.- 15

Ph.D.- 3

Patents Filed: Two

Publications

Manuals written: Six

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1. **Boora, K. S.**, A. Gulati, P. Boora and Neelam R. Yadav. 2006. Polymerase chain reaction: Principal, Methods and Applications. A Laboratory Manual. Pp 109
 2. **Yadav. N, R.**, R. C. Yadav and K. S. Boora 2006. Methods in Plant Genetic Engineering. A Laboratory Manual. Pp 102
 3. Chaudhary K, K. S Boora, V. K. Sikka **N. R. Yadav** and R. K Patel 2006. Strategies for gene cloning and expression for value addition in crop plants". CCS HAU, Hisar. Pp. 191.
 4. Chaudhary K, K. S Boora, V. K. Sikka **N. R. Yadav** and R. K Patel 2006. Practical Manual "Strategies for gene cloning and expression for value addition in crop plants" CCS HAU, Hisar. Pp. 100

5. R.C. Yadav, **N.R. Yadav**, R.B. Srivastava and R.K. Kashyap 2008 Bulletin on “Intellectual property rights in Agricultural biotechnology’, IPR cell, CCS HAU, Hisar.
6. **Neelam R. Yadav**, R.K. Jain, R.C. Yadav and V.K. Chowdhury 2009. Practical manual on “Practicals in Plant tissue culture”. CCS HAU, Hisar. Pp. 100.

Papers in National & International Journals: 70

Papers presented in Symposia/ Conferences: 60

RESEARCH HIGHLIGHTS: Micro-propagation in important medicinal plants (Safed Musli, Gurmar, Gukhuru and *Aloe vera*). Engineering *cry* genes for *Helicoverpa* resistance in Cotton and Cauliflower, Gene expression under abiotic stress tolerance, Interspecific hybridization in Guar.

1. Developed regeneration system in selected rice cultivars. Anther culture and immature embryo culture was carried out; studied variation among anther derived and immature derived plants.
2. Plant transformation system developed in indica rice using *gus* as reporter and *nptII*, *bar* and glyphosate resistance as selectable marker genes.
3. Production of transgenic rice using microprojectile and *Agrobacterium* method using insecticidal genes such as *pinII*, *cryIA(b)* and their molecular expression in progenies and performance using insect bioassays.
4. Micropropagation of female datepalm was carried out successfully and plants were transferred to Farm area where these flowered and set fruits. The regenerated plants were evaluated by isozyme and cytological studies.
5. Regeneration and transformation was optimized in selected chickpea genotypes.
6. Development of efficient and reproducible cost-effective protocols for micropropagation medicinal plants such as *Chlorophytum*, *Aloe vera* and *Tribulus terrestris*. *Chlorophytum* and *Aloe vera* plants were successfully established in field and also showed their true to type nature based on SDS-PAGE pattern for soluble proteins.
7. Transformation system in Cauliflower was established. Transgenic plants carrying *cryIAC* gene were produced. Molecular analysis and insect bioassays established them to be promising for insect resistance.

8. Gene expression under drought and salinity stress is being carried out in *Brassica* species using semi-quantitative RT-PCR.