Faculty Details proforma for DU Web-site

Title	Prof./Dr./Mr./Ms./ Mrs. PROF. (Dr.)	First Name	RAKESH K.	Last Name	SETH	Photograph
Designation		Professor				
Address		DEPARTMENT OF ZOOLOGY, UNIVERSITY OF DELHI, NORTH CAMPUS, DELHI- 110 007				
Phone No Office		27666564(Office)				
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Web-Page						

Educational Qualifications

Degree	Institution	Year
Ph.D. Zoology	**University of Delhi**	**1985**
M.Phil. Zoology	**University of Delhi**	**1980**
M.Sc. Zoology	**University of Delhi**	**1979**
B.Sc. (Hons) Zoology	**University of Delhi**	**1977**
Diploma in French	**University of Delhi**	**1982**
Certificate in French	**University of Delhi**	**1981**

Career Profile

Organisation / Institution	Designation	Duration	Role
University of Delhi	**Professor**	**2000-todate**	**Teaching and research**
University of Delhi	**Reader (UGC- Scientist-B)**	**1995-2000**	**Teaching and research**
University of Delhi	**Lecturer (UGC- Scientist-A)**	**1990-1995**	**Teaching and research**

Administrative Assignments

- Member Selection Committee, DRDO, Govt. of India
- Member Selection Committee, various Central & State Indian Universities
- Advisor, Ministry of Environment and Forests, Govt. of India
- Advisor, Staff Selection Commission(SSC), Govt. of India
- UGC Nominee for Zoology Department, Annamalai University, Tamil Nadu
- UGC Nominee for Zoology Department, Punjabi University, Patiala
- Member, Post Graduate Board of Studies, Ch. Bansilal University, Bhiwani
- Member, Faculty of Life Sciences, Maharshi Dyanand University(MDU), Rohtak.
- Member, Board of Research Studies, H.P University, Shimla
- Governing body member as VC nominee in Bhim Rao Ambedkar College, Delhi University
- Convenor, Museum committee(Zoology), Delhi University
- Member, Animal House Committee (Zoology), Delhi University.
- Member, Museum Committee (Zoology), Delhi University.

- Convenor, Assets & Equipment Committee, Zoology Department, Delhi University
- Member, Courses Committee (Zoology), Delhi University
- Member, Department Research Committee, Zoology Department, Delhi University
- Member, CIF(Central Instrumentation Facility) Committee, Delhi University.

Areas of Interest / Specialization

- **Specialization: Entomology & Radiation Biology**
- **Research Interests: Applied Entomology & Radiation Biology (Entomology); Reproductive Behaviour & Physiology**

Subjects Taught

- **Teaching experience : > 30yrs at P.G. level**
- **Courses being taught in M.Sc. : Entomology (Medical & Veterinary Entomology, Social Insects, Insect Physiology), Radiation Biology (Radio-genetic methods of pest control), Comparative Animal Physiology, Endocrine Physiology, Chronobiology, Behaviour, Parasitology** (1980-todate)
- **A New Course** introduced as "**Radiation Biology & Insect Control**" at **M.Phil**. level, in Zoology Department, Delhi Univ.(1996-todate)

Research Guidance

List against each head (If applicable)

1. *Supervision of awarded Doctoral Thesis* : **10**
2. *Supervision of Doctoral Thesis, under progress* : **4**
3. *Supervision of awarded M.Phil dissertations* : **25**
4. *Supervision of M.Phil dissertations, under progress* : **1**

Publications Profile

List against each head(If applicable) (as Illustrated with examples)

1. *Books/Monographs (Authored/Edited)*

- **Integrated Pest Management** (APM-01) of **Indira Gandhi National Open University (IGNOU)-2003** (Member in **Block Preparation Team)**
- **BIOLOGY TEXT BOOK** for class **XI** of NCERT 2006 under National Curriculum Framework-2005 (Member of **Textbook Development Committee**)

2. *Research papers published in Refereed/Peer Reviewed Journals(selected papers in last 18 years, since 2000)*

Khyati, Malik, I. and **Seth, R.K.** 2017. Insect clocks: implication in an effective pest management. *Biological Rhythm Research,* 48(5): 777-788. (IF:0.695)

Guo, H., Cheng, T., Chen, Z., Jiang, L., Guo, Y., Liu, J., Li, S., Taniai, K., Asaoka, K., Kadono-Okuda, K., Arunkumar, K.P., Wu, J., Kishino, H., Zhang, H., **Seth, R.K.,** Gopinathan, K.P., Montagné, N., Jacquin-Joly, E., Goldsmith, M.R., Xia, Q. and Mita, K. 2017. Expression map of a complete set of gustatory receptor genes in chemosensory organs of *Bombyx mori.* ***Insect Biochemistry and Molecular Biology*** (In press)**..** doi: 10.1016/j.ibmb.2017.02.001. (IF: 3.93)

Seth, R.K., Khan, Z., Rao, D.K. and Zarin, M. 2016. Appraisal of sperm dynamics as a crucial trait of radio-sterilized *Spodoptera litura* (Lepidoptera: Noctuidae) and its F_1 progeny for evaluation of the 'Inherited Sterility technique' for pest suppression. ***Florida Entomologist 99*(sp1)**: 105-118.

Seth, R.K., Khan Z., Rao, D.K. and Zarin, M. 2016. Flight activity and mating behavior of irradiated *Spodoptera litura* (Lepidoptera: Noctuidae) males and their F_1 progeny for use of Inherited Sterility in pest management approaches. ***Florida Entomologist* 99(sp1)**: 119–130.

Hood-Nowotny, R., Harari, A., **Seth, R.K**., Wee, S.L., Conlong, D.E., Suckling, D.M., Woods, B., Lebdi-Grissa, K., Simmons,G. and Carpenter,J.E. 2016. Stable Isotope Markers Differentiate between Mass-Reared and Wild Lepidoptera in Sterile Insect Technique Programs. ***Florida Entomologist* 99(sp1)**: 166-176.

Hood-Nowotny, R., Mayr, L., Saad, N., **Seth, R.K**., Davidowitz, G., and Simmons, G. (2016). Towards Incorporating Insect Isotope Analysis Using Cavity Ring-Down Spectroscopy into Area-Wide Insect Pest Management Programs. ***Florida Entomologist* 99 (sp1)** : 177-184.

Seth, R.K. Zarin, M., Khan, Z. and Seth, R. 2016. **Ionizing radiation as a phytosanitary treatment against *Phenacoccus solenopsis* (Hemiptera: Pseudococcidae).** ***Florida Entomologist* 99(sp2)**: 76-87

Seth, R. Zarin, M., Khan, Z. and **Seth, R. K.** 2016. Towards phytosanitary irradiation of *Paracoccus marginatus* (Hemiptera: Pseudococcidae): Ascertaining the radiosensitivities of all life stages. ***Florida Entomologist* 99(sp2)**: 88-101

Seth, R. Zarin, M., Khan, Z. and Seth, R. K. 2016. Phytosanitary irradiation against *Maconellicoccus hirsutus* (Hemiptera: Pseudococcidae).***Florida Entomologist* 99(sp2)**: 102-113.

Seth, R.K. (2016). Various perspectives of using radiation in applied entomology. ***Journal of Radiation and Cancer Research,*** 1(7) :5 (ID-0018).

Dhiman, A., Chauhan, R.S. and **Seth, R.K.** (2015). Suitability assessment of tropical noctuid pest, *Spodoptera litura* treated with Chlorpyrifos as a potential host for entomopathogenic nematode, *Steinernema glaseri*. ***Biopestic. Int.* 11**(1): 20-28.

Suman, S., Khan Z., Zarin, M., Chandna, S. and Seth R.K. (2015). Radioresistant Sf9 insect cells display efficient antioxidant defence against high dose γ-radiation. ***International Journal of Radiation Biology,* 91**(9): 732-741 (IF: 2.761)

Sachdev. B., Zarin. M., Zubeda, Malhotra, P., **Seth, R.K**. and Bhatnagar, R. K. 2014. Effect of gamma radiation on phenoloxidase pathway, anti-oxidant defense mechanism in *Helicoverpa armigera* (Lepidoptera: Noctuidae), and its implication in 'Inherited sterility' towards pest suppression. ***International Journal of Radiation Biology*, 90** (1):7-19. (IF: 2.761)

Chandna, S., Suman, S., Chandna, M., Pandey, A., Singh, V., Kumar, A. Dwarakanath, B.S. and Seth, R.K. (2013). Radioresistant Sf9 insect cells undergo an atypical form of Bax-dependent apoptosis at very high doses of γ-irradiation. . ***International Journal of Radiation Biology***, 89(12): 1017–1027. (IF: 2.761)

Dhiman, A and **Seth, R.K.** 2012. Compatibility of entomopathogenic nematode, *Steinernema glaseri* with cypermethrin (pyrethroid) against a Lepidopteran pest, *Spodoptera litura* (Fabr.). ***Indian J. Ent.* 74**(1): 16-23. (IF:0.5)

Suman, S., **Seth, R.K**. and Chandna, S. 2011. A calcium-insensitive attenuated nitrosative stress response contributes significantly in the radioresistance of Sf9 insect cells. ***The International Journal of Biochemistry & Cell Biology* 43:** 1340–1353. (IF: 4.009)

Singh, G., Sachdev, B., Sharma, N., **Seth, R.K**. and Bhatnagar, R.K. 2010. Interaction of *Bacillus thuringiensis* vegetative insecticidal protein with ribosomal S2 protein triggers larvicidal activity in *Spodoptera frugiperda*. ***Applied And Environmental Microbiology*, 76(21):** 7202–7209. (IF: 3.686)

Swain, V., **Seth, R.K**., Raghavendra, K., Mohanty, S.S. 2009. Impact of temperature on susceptible and resistant strains of

Culex quinquefasciatus to synthetic pyrethroids. ***Acta Tropica***. **112(3)** : 303-307.(IF: 2.446)

Seth, R.K., Barik, T.K. and Chauhan, S. 2009. Interaction of entomopathogenic nematodes, *Steinernema glaseri* (Rhabditida: Steinernematidae), cultured in irradiated hosts, with 'F1 sterility': Towards management of a tropical pest, *Spodoptera litura* (Fabr.) (Lepidoptera: Noctuidae), ***Biocontrol Science and Technology*****, 19 (S1)**: 139-155. (IF: 1.087).

Seth, R.K. and Barik, T.K. 2009. Assessment of infective behaviour and reproductive potential over successive generations of entomopathogenic nematodes, *Steinernema glaseri* (Rhabditida: Steinernematidae), reared within radiosterilized host larvae, towards *Spodoptera litura* (Lepidoptera: Noctuidae), ***Biocontrol Science and Technology*****, 19(S1)**:111-125 (IF: 1.087).

Reynolds, S.E., Brown, A.M., **Seth, R.K.,** Riddiford, L.M. and Hiruma.K. 2009. Induction of supernumerary larval moulting in the tobacco hornworm *Manduca sexta*: Interaction of *bis*acylhydrazine ecdysteroid agonists with endogenous juvenile hormone. ***Physiological Entomology*** **34 :** 30–38. (IF: 1.410)

Kumarswamy, R., **Seth, R.K.**, Dwarakanath, B.S., Chandna, S. 2009. Mitochondrial regulation of insect cell apoptosis: Evidence for permeability transition pore – independent Cytochrome-c release in the Lepidopteran Sf9 Cells. ***The International Journal of Biochemistry & Cell Biology*** **41**: 1430–1440. (IF: 4.009)

Suman, S., **Seth, R.K**. and Chandna, S. 2009. Mitochondrial antioxidant defence in radio-resistant *Lepidopteran* insect cells**.** ***Bioinformation*** **4(1)**: 19-23 (IF:1.15)

Suman, S., Khaitan, D., Pati, U., **Seth, R. K.** and Chandna, S. 2009. Stress response of a p53 homologue in the radioresistant Sf9 insect cells. ***International Journal of Radiation Biology*** **85(**3):238-249. (IF: 2.761)

Seth,R.K. Zubeda, Zarin,M., Tanwar, R.K., Jeyakumar,P. Bambawale,O.M. 2009. Gamma-irradiation of *Phenacoccus solenopsis* (Homoptera: Pseudococcidae) for Phytosanitary Treatment of Agricultural Commodities. ***NCIPM Newsletter*** 15(1):9.

Swain,V., **Seth, R.K**., Raghavendra, K. and Mohanty, S.S. 2009. Characterization of biochemical based insecticide resistance mechanism by thermal bioassay and the variation of esterase activity in *Culex quinquefasciatus*. ***Parasitology Research*****. 104** : 1307–1313. (IF: 1.512)

Swain,V., **Seth, R.K**., Mohanty, S.S. and Raghavendra, K. 2008. Effect of temperature on development, eclosion, longevity and survivorship of malathion-resistant and malathion-susceptible strain of *Culex quinquefasciatus*. ***Parasitology Research*****. 103**: 299-303. (IF: 1.512)

Suman, S., **Seth, R.K**. and Chandna, S. 2008. Role of nitric oxide synthase in insect cell radioresistance: an *in-silico* analysis. ***Bioinformation*** 3(1): 8-13. (IF:1.15)

Seth, R.K., Barik, T.K. and Gautam, R.D. 2007. Safety Evaluation of Parthenium Beetle, *Zygogramma bicolorata* Pallister (Chrysomelidae: Coleoptera) against Entomopathogenic nematode, *Steinernema glaseri* (Steiner). ***J. Ent. Res.*** 31(4): 313-317.(IF:0.5).

Seth, R.K., and Barik,T.K. 2007. Effect of host irradiation on bio-infectivity and proliferation capacity of *Steinernema glaseri* as entomopathogenic nematodes on a serious tropical pest, *Spodoptera litura.* ***J.Nuclear Agric. Biol.*** **36**, 81-101. (IF: 0.5)

Seth, R.K., Zubeda, Zarin, M. and Mehta, V.K. 2006. Nuclear science in disinfestation of agro-stored products and quarantine. ***J. Nuclear Agric. Biol.*** *35*: 121-153**.** (IF: 0.5)

Suman, S., **Seth, R.K.,** Khaitan, D and Chandna,S. 2006. Nature and stress response of a p53 like protein found in the radioresistant Sf9 insect cells. ***Indian Journal of Radiation Research*****, 3**(4)282-283(IF: 0.5).

Friedländer, M., Seth, R.K. and Reynolds, S.E. 2005. Eupyrene and apyrene sperm : dichotomous spermatogenesis in Lepidoptera. ***Advances in Insect Physiology***, **32**: 206-308. (IF: **7.33**)

Sharma, A.K. and **Seth, R.K.** 2005. Combined effect of gamma radiation and Azadirachtin on the growth and development of *Spodoptera litura* (Fabricius). ***Curr. Sci.*** **89**, (6): 1027-1031. (IF: 0.5)

Chandna, S., Dwarakanath, B.S., **Seth, R.K.**, Khaitan, D., Adhikari, J.S. and Jain, V. 2004. Radiation responses Sf9, a highly

radioresistant Lepidopteran insectcell line. ***Int. J. Radiat. Biol.*** **80**(4): 301-315. (IF: 2.761)

Seth, R.K., Kaur, J.J., Rao, D.K., and Reynolds, S.E. 2004. Effects of larval exposure to sublethal concentrations of the ecdysteroid agonists RH-5849 and tebufenozide (RH-5992) on male reproductive physiology in *Spodoptera litura*. ***J. Insect Physiol.*** **50**: 505-517. (IF: 2.236)

Seth, R.K., Lovell, K.V. and Reynolds, S.E. 2003. Effects of gamma irradiation on proliferation and survival of Sf9 cells : radio-resistance in a Lepidopteran insect cell-line. ***J. Nuclear Agric. Biol.*** **32**(3-4): 179-191. (IF: 0.5)

Seth, R.K., Kaur, J.J., Rao,D.K. and Reynolds, S.E. 2002b. Sperm transfer during mating , movement of sperm in the female reproductive tract, and sperm precedence in the common cutworm *Spodoptera litura*. ***Physiological Entomology,*** **27**: 1-14. (IF: 1.410)

Ramesh, K., Garg, A.K. and **Seth, R.K.** 2002. Interaction of substerilizing gamma radiation and thiodicarb treatment for the management of the tobacco caterpillar, *Spodoptera litura.* ***Phytoparasitica*** **30** (1) : 7-17.

Seth, R.K., Rao, D.K. and Reynolds, S.E. 2002a. Movement of spermatozoa in the reproductive tract of adult male *Spodoptera litura*: daily rhythm of sperm descent and the effect of light regime on male reproduction. ***J. Insect Physiol.*** **48**: 119-131. (IF: 2.761)

Seth, R.K. and Sharma, Vandana P. 2001. Inherited sterility by substerilizing radiation in *Spodoptera litura* (Lepidoptera: Noctuidae): Bioefficacy and potential for pest suppression. ***Florida Entomologist*****, 84** (2): 183-193. (IF:1.363)

Kaur, J.J. Rao, D.K., Sehgal, S. S. and **Seth, R.K.** 2001. Effect of hexane extract of neem seed kernel on development and reproductive behaviour of *Spodoptera litura* (Fabr.) ***Ann. Pl. Protec. Sci.*** **9** (2) : 171-178. (IF:0.5)

Seth, R.K., Rao, D.K. and Kaur, J.J. 2000. Developmental pattern of testes in F_1 progeny of gamma irradiated *Spodoptera litura* (Fabr.). ***J. Nuclear Agric. Biol.*** **29 (3-4)**: 129-141. (IF: 0.5).

3.

a) Research papers published in Academic Journals other than Refereed/Peer Reviewed Journals Nil

b) Research papers published in Refereed/Peer Reviewed Conferences

Mehta, V.K., Sethi, G.R., Garg, A.K. & **Seth, R.K.** 2007. Use of ionizing radiation in interaction with fumigants towards management of *Tribolium castaneum* (Herbst). Donahaye, E.J., Navarro, S., Bell, C., Jayas, D., Noyes, R., Phillips, T.W. [Eds.] *Proc. Int. Conf. Controlled Atmosphere and Fumigation in Stored Products, Gold-Coast Australia. 8-13th August 2004.*FTIC Ltd. Publishing, Israel. pp. 467-474 *(Reviewed by International Committee)*

Seth, R.K., Barik, T.K. and Chauhan, S. 2005. Influence of host irradiation on the bio-infectivity of *Steinernema glaseri* as entomopathogenic nematodes and their perpetuating parasitization potential on a serious tropical lepidopteran pest, *Spodoptera litura* In: Proc. **Ext. Synopses** " ***FAO/IAEA International Conference on Area-Wide Control of Insect Pests: Integrating the Sterile Insect and Related Nuclear and other Techniques,*** Vienna (9 – 13 May 2005) pp: 336-337. (Reviewed by IAEA Tech doc. committee).

Sachdev, B., Agrawal, N., Ahmad,T., Sivakumar, S., **Seth, R. K.,** and Bhatnagar, R. K. 2005. Cloning and expression of prophenoloxidase (PPO) gene and its activating enzyme from *Heliothis armigera*. In: Proc.*"ICAR National Symposium on Biotechnological Interventions for Improvement of Horticultural Crops: Issues and strategies"*. Kerala Agricultural University, Thrissur, Kerala. (10-12 Jan. 2005). pp : 312-315.

Seth, R.K. 2003. Influence of radiation on parasitoid-host interaction between entomopathogenic nematodes, *Steinernema glaseri* and host, *Spodoptera litura* vis-à-vis other Control Tactics. *In* Proc. III RCM by Joint FAO/IAEA Division of Nuclear Techniques in Food & Agriculture on Co-ordinated Research Programme on "*Use of Nuclear Techniques for the Colonization &Production Production of Natural Enemies of agricultural insect pests*" Vienna, Austria (3-7 Nov. 2003) . pp: 113-139.

(Reviewed by IAEA Tech doc. committee)

Seth, R.K., Tyagi, S. and Baweja, V. 2001. Effect of host -irradiation on bioefficacy of entomopathogenic nematode, *Steinernema glaseri* as potential parasitoid on lepidopteran pest, *Spodoptera litura* (Fabr.). *In* Proc. II RCM by Joint FAO/IAEA Division of Nuclear Techniques in Food & Agriculture on Co-ordinated Research Programme on "*Use of Nuclear Techniques for the Colonization and Production of Natural Enemies of agricultural insect pests*" Tapachula, Chiapas, Mexico, 18 – 22 June 2001. (Reviewed by IAEA Tech doc. committee)

Seth, R.K. and Sharma, V.P. 2001. Growth, development, reproductive competence and adult behaviour of *Spodoptera litura* (Lepidoptera: Noctuidae) reared on different diets. *In* Proc. FAO/IAEA Final-Research Coordination Meeting, "Evaluation of Population Suppression by Irradiated Lepidoptera and their Progeny", 28-30 May 1998. Penang, Malaysia IAEA-D4-RC-561: 21-28. (Reviewed by IAEA Tech doc. committee).

c) Research papers Published in Conferences/Seminar other than Refereed/Peer Reviewed Conferences
Nil

4. Other publications (Edited works, Book reviews, Festschrift volumes, etc.)

- **R. K. Seth**. (2007). Nuclear Science in Pest Management: Potential Untapped in India (by) in UT's Voice, New Delhi (July 16-31, 2007)
- **R. K. Seth.** (2010). Role of Nuclear Energy in Insect Science : Applied Perspectives and Potential in India. In: *Advances in Entomology*(Eds: Jagbir Singh Kirti and Ashwani Kumar), Kanishka Publishers, New Delhi. pp: 248-280.

Conference Organization/ Presentations (last ten years)

List against each head(If applicable)

1. ***Organization of a Conference*** Nil

2. ***Participation as Paper/Poster Presenter***

Seth, R.K., Singh, K., Singh, C.K. and Lanbiliu, P. 2018. Ascertaining certain parameters that may influence reproductive fitness of moths to be employed in radio-genetic F1 Sterility technique for suppression of a noctuid pest, *Spodoptera litura* (Fabr.). In : II FAO/ IAEA Research Co-ordination Meeting on CRP, "Improved Field Performance of Sterile Male Lepidoptera to Ensure Success in SIT Programmes' (March 12-16, 2018).

Seth, R.K., Khan, Z., Rao, D.K. Zarin, M. and Seth, R. 2017. Sperm behavior as a key tool ensuring operative efficiency of radio-genetic 'F_1 Sterility technique' for population suppression of an economically serious Indian pest, *Spodoptera litura* (Fabr.) (Lepidoptera: Noctuidae) in lab and field simulated cages. ***"Third FAO–IAEA International Conference on Area-wide Management of Insect Pests: Integrating the Sterile Insect and Related Nuclear and Other Techniques",*** **(IAEA-CN-248),** Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, IAEA, Vienna, Austria (22–26 May 2017).

Seth, R.K., Patil, B.V., Haveri, R. V., Hanchinal, S.G., Zarin, M., Khan, Z. and Seth, R. 2017. Establishing a generic radiation dose as post harvest phyto-sanitary treatment against bruchid species (Coleoptera: Chrysomelidae) infesting legumes. ***"Third FAO–IAEA International Conference on Area-wide Management of Insect Pests: Integrating the Sterile Insect and Related Nuclear and Other Techniques",*** **(IAEA-CN-248),** Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, IAEA, Vienna, Austria (22–26 May 2017).

Patil, B.V., Hanchinal, S.G., Khan, Z., Zarin, M., Haveri, R. V., Chandrashekhar, Yelshetty, S. and **Seth, R. K.** 2017.

Ascertaining the efficacy of gamma radiation on the flower webber, *Maruca vitrata* (Fabr.) (Lepidoptera: Crambidae) to establish Inherited Sterility technique for the management of this pigeonpea pest in India. ***"Third FAO–IAEA International Conference on Area-wide Management of Insect Pests: Integrating the Sterile Insect and Related Nuclear and Other Techniques",* (IAEA-CN-248),** Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, IAEA, Vienna, Austria (22–26 May 2017).

Haveri, R. V., Hanchinal, S.G., Chandrashekhar, Zarin, M., Khan, Z., Patil, B.V., Yelshetty, S. and **Seth, R. K.** 2017. Optimization of semi-synthetic diet for quality mass rearing of the legume pod borer, *Maruca vitrata* (Fabr.) (Lepidoptera: Crambidae) towards employment of 'Inherited Sterility' technique for the pest suppression. ***"Third FAO–IAEA International Conference on Area-wide Management of Insect Pests: Integrating the Sterile Insect and Related Nuclear and Other Techniques",* (IAEA-CN-248),** Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, IAEA, Vienna, Austria (22–26 May 2017).

Singh, K. Seth, R.K. and Kumar,V. 2017. Expression pattern of clock genes in the testes of a noctuid tropical pest, *Spodoptera litura* (Fabricius) (Lepidoptera: Noctuidae). In: *"International Symposium on Biological Timing and Health Issues in 21st century", University of Delhi, India* (Feb. 21-24, 2017).

Seth, R.K.,Khan, Z., Rao, D.K. and Zarin, M. 2016. Sperm activity and mating competence as crucial attributes of irradiated males and their F1 progeny in 'Inherited Sterility' tactic for suppression of a tropical pest, *Spodoptera litura* (F.) (Lepidoptera: Noctuidae). XXV International Congress of Entomology (ICE 2016), Orlando, Florida, USA (Sept. 25-30, 2016)

Khan, Z. and **Seth, R.K**. 2016. Effect of sub-sterilizing ionizing radiation on oxidative stress and DNA damage in irradiated tropical pest, *Spodoptera litura* (Fabr.) and its F_1 progeny. XXV International Congress of Entomology (ICE 2016), Orlando, Florida, USA (Sept. 25-30, 2016)

Zarin, M. Seth, R. and **Seth, R.K**. 2016. Bio-efficacy of phytosanitary irradiation against the various ontogenic stages of the Solenopsis mealybug, *Phenacoccus solenopsis* (Homoptera: Pseudococcidae) . XXV International Congress of Entomology (ICE 2016), Orlando, Florida, USA (Sept. 25-30, 2016)

Seth, R.K. Khan, Z and Zarin, M. 2016. Quality improvement of mass reared moths and competitiveness of radio-sterilized lepidopteran pest, *Spodoptera litura* and its F_1 progeny in field simulated cages towards effective pest suppression 2016. In : I FAO/ IAEA Research Co-ordination Meeting on CRP, Improved Field Performance of Sterile Male Lepidoptera to Ensure Success in SIT Programmes' (31 Aug-4 Sept., 2016).

Seth, R.K. 2016. Various perspectives of using radiation in applied entomology. In: 'International Conference on Radiation Research: Impact on Human Health and Environment (ICRR-HHE-2016)' Mumbai (Feb. 11-13, 2016).

Seth, R , Zarin, M., Zubeda, and **Seth, R.K.** 2014. Ascertaining the radio-sensitivity of the papaya mealybug, *Paracoccus marginatus* towards setting up phytosanitary irradiation regimen against this tropical quarantine pest. *International Symposium on Food Safety and Quality: Applications of Nuclear and Related Techniques* - CN-222, IAEA, Vienna (Nov.10-13, 2014)

Seth, R.K., Zubeda and Zarin, M., Sachdev B., Rao, D.K., and Bhatnagar, R.K. 2014. Appraisal of Crucial Behavioural, Physiological and Biochemical Characteristics of Radio-sterilized Lepidopteran pest, *Spodoptera litura* (Fabr.) and its Progeny to establish the Quality traits for a Critical Assessment of 'F_1 Sterility Technique' for Pest Suppression. In : Fourth FAO/ IAEA Research Co-ordination Meeting on CRP, *"Increasing the Efficiency of Lepidoptera SIT by Enhanced Quality Control"* Kelowna, Canada (June 2-6, 2014).

Seth, R , Zarin,M., Zubeda, and **Seth, R.K.** 2014. Bio-efficacy of ionizing radiation as phytosanitary treatment against mealybug species of quarantine importance, viz., *Phenacoccus solenopsis, Maconellicoccus hirsutus* and *Paracoccus marginatus.*. Fourth FAO/IAEA Research Co-ordination Meeting on CRP, *"Development of generic irradiation doses for quarantine treatment",* IAEA, Vienna (2-6 June 2014)

Seth, R.K., Zubeda and Zarin, M. 2012. Sperm dynamics in correlation with mating behaviour of sub-sterilized irradiated male moths, *Spodoptera litura* and their F1 progeny as a crucial assessment of 'Inherited Sterility' technique for Lepidopteran pest suppression. In : Third FAO/IAEA Research Co-ordination Meeting on CRP, *"Increasing the Efficiency of Lepidoptera SIT*

byEnhanced Quality Control" Phoenix, Arizona, USA (Sept. 12-16, 2012)

Seth, R , Zarin,M., Zubeda, and **Seth, R.K.** 2012. Bio-efficacy of gamma radiation as phytosanitary treatment against various ontogenetic stages of the Solenopsis mealybug, *Phenacoccus solenopsis* and the Pink hibiscus mealy bug, *Maconellicoccus hirsutus.* Third Research Co-ordination Meeting on CRP, *"Development of generic irradiation doses for quarantine treatment",* Buenos Aires, Argentina (15-19 October 2012).

Zarin, M., **Seth, Ranjana** , Zubeda, and **Seth, R.K.** 2012. Bioefficacy of gamma radiation on *Phenacoccus solenopsis* (Hemiptera: Pseudococcidae). In: *"**International conference on Emerging Frontiers and Challenges in Radiation Biology**"*, Bikaner, Rajasthan(24-25 Jan, 2012).

Zubeda, Zarin, M., Seth, R., and **Seth, R.K**. 2012. Influence of ionizing radiation on flight activity of F-1 progeny of sub-sterilized male moths of *Spodoptera litura* (Fabr.) [Lepidoptera : Noctuidae]. In: ***"International conference on Emerging Frontiers and Challenges in Radiation Biology"***, Bikaner, Rajasthan (24-25 Jan, 2012).

Seth, R , Zarin,M., Zubeda, and **Seth, R.K.** 2011. Efficacy of gamma radiation as phytosanitary treatment against the Solenopsis mealybug, *Phenacoccus solenopsis*. Second Research Co-ordination Meeting on CRP, *"Development of generic irradiation doses for quarantine treatment",* Texas A&M University College Station, Texas, 11 to 15 April 2011.

Seth, R.K.2011. Environment-friendly Application of Nuclear Energy in Insect Science : Using Radiation in Biological Control as An Approach towards Sustainable Biodiversity. ***"Exploring New Vistas in Biodiversity Research"***, Chandigarh, Panjab University, 22-23 Jan.2011.

Seth, R.K. 2010. Potential Role of Radiation in Applied Entomology: Commercial Perspectives. In : *"International Conference on RADIATION PROCESSING: Value addition for Food, Agro, Healthcare and Other Industrial Products"* at Delhi. Dec. 17-18, 2010.

Seth, R.K., Zubeda and Zarin, M. 2010. Flight activity, mating competence and sperm behaviour of radio-sterilized lepidopteran pest, *Spodoptera litura* and its progeny. In : Second FAO/IAEA Research Co-ordination Meeting on CRP, *"Increasing the Efficiency of Lepidoptera SIT by Enhanced Quality Control"* Stellenbosch, South Africa, 15-19 Nov. 2010.

Seth, R.K. 2010 . Radio-genetic Technique for Management of Mosquitoes Vectoring Communicable Diseases. *National Conference on Medical Biotechnology "Vision 2020", at Advanced Centre for Biotechnology,* Maharishi Dayanand University, Rohtak-124001, Haryana (16-18 April, 2010).

Seth, R.K. 2009. Evaluation of various bio-characteristics of radio-sterilized lepidopteran pest, *Spodoptera litura* and its progeny to establish the quality traits for a critical appraisal of 'F_1 sterility technique' for pest suppression. First Research Co-ordination Meeting on CRP, *"Increasing the Efficiency of Lepidoptera SIT by Enhanced Quality Control"* Christchurch, New Zealand, 27April – 01 May 2009.

Seth, R.K. 2009. Potential Role of Nuclear Techniques in Management of Insect Vectors of Communicable Diseases in Tribal Area *"International Symposium on Tribal Health"* at Regional Medical Research Centre, Jabalpur (MP), 27 Feb.-1 March 2009.

Suman, S., **Seth, R. K.** Chandna, S. 2009. Reduced activation of nitric oxide synthasein the radio- resistant Sf9 insect cells. In: *"National Symposium on Emerging Trends in Nitric Oxide Research: Impact on Health, Disease and Drug Development*". Vallabhbhai Patel Chest Institute, University of Delhi, Delhi-110 007.

Suman, S., **Seth, R. K.** Chandna, S. 2008. Reduced activation of nitric oxide synthase may contribute to intrinsic radio-resistance of lepidopteran insect cells. In: *"The International Conference on Radiation Biology & Translational Research In Radiation Oncology (ICRB 2008)",* Rajasthan University Jaipur, Nov 10-12, 2008.

Suman, S., **Seth, R. K.** Chandna, S. 2008. Nitric oxide donor induced alteration of radiation response in radio-resistant insect cells. In: *"The International Conference on Radiation Biology & Translational Research In Radiation Oncology(ICRB 2008)",* Rajasthan University Jaipur, Nov 10-12, 2008.

Swain, V, Yadav, K., Zarin, M., Zubeda, Raghvendra, K., **Seth, R.K.** 2008. Radio-biological investigations on malarial vector, *Anopheles stephensi* Liston and filarial vector *Culex quinquefasciatus* Say (λ-Cyhalothrin resistant). In: "***IX International Symposium on Vectors and Vector Borne Diseases***", Puri, Orissa (India), 15-17 Feb. 2008

Seth, R.K. 2008. Use of Nuclear Techniques in Management of Mosquitoes as Disease Vectors: Indian Perspectives In: "***IX***

International Symposium on Vectors and Vector Borne Diseases", Puri, Orissa (India), 15-17 Feb. 2008

Suman, S., **Seth, R.K**. and Chandna, S. 2007. Reduced nitric oxide synthase may contribute to the unusual radio-resistance of Sf9 cells. In *"The Cytometry Meet 2007"*, Dec. 17-18, 2007, Sanjay Gandhi P.G. Institute of Medical Sciences, Lucknow (Abstract pp27).

Swamy, R.K., Khiatan, D., Dwarkanath,B.S., **Seth, R.K.,** and Chandna,S. 2007. Role of cytochrome –C protein in insect cell apoptosis: Are all events of apoptosis shared in all insect orders? ***"XXX All India Cell Biology Conference" Molecules to Compartments : Cross Talks & Networks"*** (Feb. 2-4, 2007), Department of Zoology, University of Delhi, (Abstract pp 142).

Seth, R.K 2007. Irradiation as a phytosanitary treatment for insect disinfestations in post harvest food and allied commodities: potential with environmental compatibility. In ***"International Conference on Radiation Processing of Agro and Allied Products: Recent Trends and Future Prospects"***(ICRAAP-2007) (Feb 12-13, 2007), Delhi (Abstract pp 34).

Seth, R.K 2006. Applications of Radiation in Entomology. In Mini-Symposium on ***"Current Trends in Radiation Biology"*** (17th Nov.2006), INMAS, Delhi.

Recent Invited /Plenary lectures

Seth, R.K. 2011. Use of Nuclear Technology in Forest Insect-Pest Management. In: *"Seminar on Insect-Pests and Diseases: Their Incidences and Management in Forest Ecosystem"*, at Himalayan Forest Research Institute, Shimla-171009 (25-26 May, 2011). Abstract pp: 1-3 **[Plenary lecture]**

Seth, R.K. 2011. Insect and Environment. In: *Orientation Course on "Environmental Studies",* Punjabi University, Patiala (7-26 Nov.2011) [**Invited Talk]**

Seth, R.K. 2011. Environment-friendly Methods for Pest Management (Nuclear Energy in ecologically sound pest suppression). In: *Orientation Course on "Environmental Studies",* Punjabi University, Patiala (7-26 Nov.2011) [**Invited Talk]**

Seth, R.K. 2012. Nuclear Technology in Pest Management. In: "International conference on Emerging Frontiers and Challenges in Radiation Biology", Bikaner, Rajasthan (24-25 Jan, 2012) [**Invited Talk]**

Seth, R.K. 2012. Application of Nuclear Technology in Insect Pest Management in India: An Ecologically Sound Approach. In: *"International Conference on Entomology"* at Punjabi University, Patiala (Feb. 17-19, 2012). **[Plenary lecture]**

Seth, R.K. 2013. Application of Nuclear Technology in Insect Pest Management in India : An Ecologically Sound Approach. *In : National Institute of Plant Health Management (NIPHM) Training Course*, Hyderabad (12 Feb. 2013) [**Invited Talk -as adjunct faculty]**

Seth, R.K. 2013. Use of Nuclear Techniques in Augmentation of Biological Control. *In : National Institute of Plant Health Management (NIPHM) Training Course*, Hyderabad (12 Feb. 2013) [**Invited Talk -as adjunct faculty]**

Seth, R.K. 2013. Irradiation as a Phytosanitary Treatment for Insect Disinfestations in Post Harvest Food and Allied Commodities: Potential with Environmental Compatibility. *In : National Institute of Plant Health Management (NIPHM) Training Course*, Hyderabad (12 Feb. 2013) [**Invited Talk -as adjunct faculty]**

Seth, R.K. 2014. Employing Nuclear Technology in Insect Pest Management: An Environment Friendly Component in IPM. In: *"International Conference on Entomology"* at Punjabi University, Patiala (Feb. 21-23,

2014) [Plenary lecture]

Seth, R.K. 2015. Pertinence of Nuclear Technology in Applied Entomology. In: National Seminar on, "Innovative Researches in Life Science", at M D University, Rohtak (Feb. 21, 2015) **[Key Note Address].**

Seth, R.K. 2015. Insect Biodiversity and Environment. In: Workshop on Insect taxonomy, organized by Department of Zoology & Enviornment, Punjabi University, Patiala (March 9, 2015) [**Presidential address]**

Seth, R.K. 2015. Pertinence of Nuclear Technology in Applied Entomology. In: National Seminar, "Innovative Researches in Life Science" at M D University, Rohtak (Feb. 21, 2015). [**Key Note Address]**

Seth, R.K. 2015. Insect Biodiversity and Environment. In: Workshop on Insect taxonomy, organized by Department of Zoology & Enviornment, Punjabi University, Patiala (March 9, 2015) **[Presidential address]**

Research Projects (Major Grants/Research Collaboration)

Funding Agency	**Title of the project**	**Period**	**Grant**
D.S.T., Delhi	Bioenergetics and Reproductive Competence of *Spodoptera litura* in F_1 progeny of irradiated Moths	1987 - 1990	Rs3.1 Lakhs
Intern. Atomic Energy Agency (IAEA), Vienna	Evaluation of Partial Sterilizing Doses & Inherited Sterility on Competitiveness and Behaviour of F_1 progeny of *S. litura* (Contr. 7162/RB)	1993 - 1999	US$ 31000
Commission of European Communities (CEC), Brussels	Male Reproductive Physiology of Lepidopteran Insects: A Target Pest Suppression Techniques (Contract No. CI1*CT940094)	1995- 1998	ECU 118,000 (for Joint project)
INMAS, Delhi Min. of Defence, Govt. of India	Studies on radiation response of Sf9, an unusually radioresistant insect cell line (INMAS ref. TC/2519/INM-280)	1999- 2001	Rs. 4.5 lakhs
Intern. Atomic Energy Agency (IAEA), Vienna	Use of Nuclear Tech. in Biological Control of Lepidopteran pest, *S. litura*: Exploration, Efficacy and Establishment of Entomopathogenic Nematodes as Potential Parasitoids(Contr. 10847/RB)	1999- 2006	US$40,000
INMAS, Delhi Min. of Defence, Govt. of India	Role of anti-oxidant defense in the *s*tress response of radioresistant lepidopteran insect in comparison to mammalian system	2006-2008	Rs.10 lakhs
Intern. Atomic Energy Agency (IAEA), Vienna	Evaluation of various bio-characteristics of radio-sterilized lepidopteran pest, *Spodoptera litura* and its progeny to establish the quality traits for a critical appraisal of 'F_1 sterility technique' for pest suppression (IAEA Contract No. 15557/RB)	2009-2015	€ 35,000
Min. of Agric.-DOCD Project	Validation of F1 Sterility Technique (a modified SIT- i.e., Sterile Insect Technique) for the management of *Spodoptera litura* (Fabr.) in cotton ecosystem[Under NISPM(Bt Cotton)-TMC-MM-II]	2009-2010	Rs.10Lakhs

International Atomic Energy Agency (IAEA), Vienna	Development of Generic Irradiation Doses for Phytosanitary Treatment of Mealy Bug Spp. Infesting Agricultural Commodities'(IAEA Contract No. 15852/RB)	2009-2015	€ 40,000
National Food Security Mission (NFSM), Ministry of Agriculture, Govt. of India	"Investigation on the Present Pigeonpea Pest Complex and Their Management with Emphasis on Radiation Technology as An Integral Component in IPM". [Joint Project between Delhi University and University of Agricultural Sciences (Raichur)	2013-2017	Rs.166 lakhs (DU share)
International Atomic Energy Agency (IAEA), Vienna	"Quality improvement of mass reared moths and assessment of competitiveness of radio-sterilized lepidopteran pest, *Spodoptera litura* and its F_1 progeny in field simulated cages for pest suppression through 'Inherited sterility technique" under FAO/IAEA CRP (D41026) on "*Improved Field Performance of Sterile Male Lepidoptera to Ensure Success in SIT Programmes"* (IAEA Contract No. 20565/RB)	2016-2021	€ 38,000

Minor Research grants:

- **2.5 Lakhs** under R & D Doctoral Research Programs at Delhi University (2007-2008)
- **2.5 Lakhs** under R & D Doctoral Research Programs at Delhi University (2008-2009)
- **2.5 Lakhs** under R & D Doctoral Research Programs at Delhi University (2009-2010)
- **2.5 Lakhs** under R & D Doctoral Research Programs at Delhi University (2010-2011)
- **2.5 Lakhs** under R & D Doctoral Research Programs at Delhi University (2011-2012)
- **2.5 Lakhs** under R & D Doctoral Research Programs at Delhi University (2012-2013)
- **2.8 Lakhs** under R & D Doctoral Research Programs at Delhi University (2013-2014)
- **3.0 Lakhs** under R & D Doctoral Research Programs at Delhi University (2014-2015)
- **3.0 Lakhs** under DST PURSE Grant (2014-2015)
- **2.7 Lakhs** under R & D Doctoral Research Programs at Delhi University (2015-2016)
- **3.0 Lakhs** under DST PURSE Grant (2016)

Awards and Distinctions

- **UGC National Scholarship (1977-1979)**
- **CSIR Research fellowship (1980-1985)**
- **UGC Research Associateship (1987-1990); Awarded DST young scientist award/project in 1987**
- **UGC Research Scientist – National Award (1990)**
- **Won International Logo Contest of IAEA**, Vienna (1990).
- **Awarded European Commission Post Doctoral Fellowship** at the Univ. of Bath, **UK** (Sept. 1991-Sept. 1992)
- **Awarded four IAEA projects (1993-1999; 1999-2006; 2009-2015; 2009-2015); Awarded EC project in 1995-1998**
- **Elected Fellow of Royal Entomological Society (FRES-UK) in 1991;**
- **Elected Fellow of Ind. Society for Nuclear Techniques in Agriculture Sciences (FNAS) in 1995;**
- **Elected fellow of Entomological Society of India (FESI) in 2000**
- **Elected Fellow of National Academy of Sciences, Allahabad (FNASc.) (2010)**
- **Presented 'Award of Honour' at the *"International Conference on Entomology"*** at Punjabi University, Patiala (Feb. 17-19, 2012).
- **Chaired the Technical session** in Third FAO/IAEA RCM on CRP, ***"Increasing the Efficiency of Lepidoptera SIT by Enhanced Quality Control"*** Phoenix, Arizona, USA (Sept. 12-16, 2012)
- **Chaired the Plenary session in *"National Conference on Application of Natural Products for Human Health & Bioremediation of Pollutants"*** at Rajasthan University, Jaipur (March 22-23, 2013).
- **Resource person in** "Workshop on Insect Taxonomy", organized by 'Department of Zoology & Environmental Sciences, Punjabi University, Patiala' in collaboration with 'Association of Entomologists' (March 9, 2015)

Association With Professional Bodies

1. *Editing*

Member of Editorial Advisory Board of ***Indian Journal of Entomology*** (since 2004); ***J. Nuclear Agric. Biol*** (since 2007)

2. *Reviewing*

Acting as Referee to National and International Projects (from IAEA, EPA, USDA, DST, CSIR, DRDO, etc.) and various International and National Journals (*Bull Ent. Res.; J. Insect Physiol. Florida Ent., J. Nuclear Agric. Biol., Current Science, Biopesticide Int.*, etc)

3. *Advisory*

Advisor to *J. Nuclear Agric. Biol.* (since 2007)

4. *Committees and Boards*

- Advisor at Staff Selection Commission, Govt. of India (since 2004)
- Member of Textbook Development Committee for BIOLOGY TEXT BOOK for class XI of NCERT 2006 under National Curriculum Framework-2005.
- Member, Content Advisory Committee (CAC) for Biology, Educational Help Line, HRD Ministry
- Member of Block Preparation Team of "Integrated Pest Management" (APM-01) of Indira Gandhi National Open University (IGNOU)-2003

5. *Memberships/Fellowship*

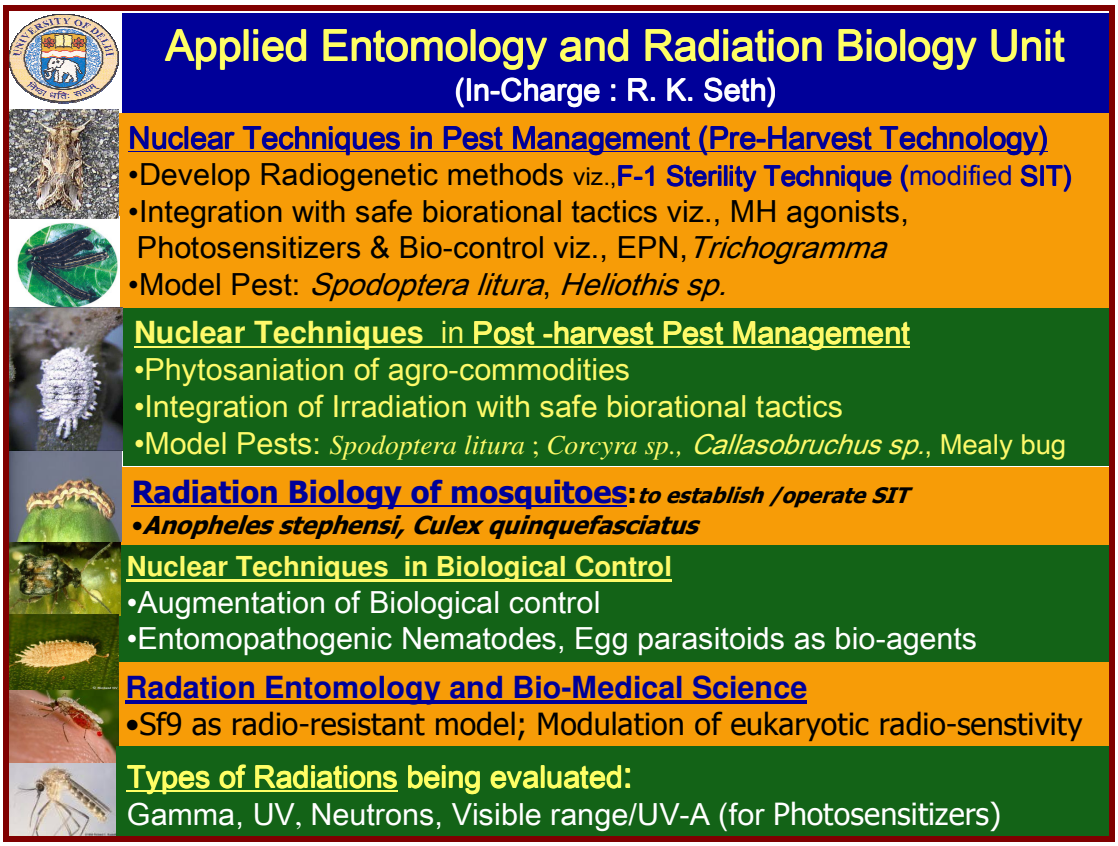
- Life member of Entomological Society of India (ESI)
- Life member of Indian Society for Nuclear Techniques in Agriculture and Biology (ISNA).
- Life member of Applied Zoologist's Research Association (AZRA).
- Life member of Society of Plant Protection Sciences
- Life member of Indian Society for Radiation Biology (ISRB).
- Life member of Association of Entomologists (2015).
- **Fellow** of Royal Entomological Society (**FRES),** U.K. (1991).
- **Fellow** of Ind. Soc. Nuclear Techniques in Agric. Sciences (**FNAS**) (1995).
- **Fellow** of Entomological Society of India (**FESI**) (2008).
- **Fellow** of National Academy of Sciences, Allahabad (**FNASc.**) (2010)

6. *Office Bearer*

Other Activities

International Trainings

S.NO.	DETAILS	PERIOD	ORGANIZATION
1	International Training Work on "Use of Irradiation to reduce Post Harvest Food Losses"	Feb. 13-24, 1989	IAEA/FAO-Intern.Consultant Group on Food Irradiation (ICGFI); conducted at BARC,Bombay
2	Good Microbiological Practice	Nov. 1-30, 1991	University of Bath, UK
3	Training Course on Introduction to Basic Techniques in Molecular Genetics	April 5-10, 1992	University of Bristol, UK
4	Training Course & Work-shop on "Flow Cytometry in Cellular & Molecular Biology"	March 14-25, 1994	ICMR, India & GFSUF Germany, Conducted by INMAS, Delhi.
5	International Workshop on "Mass Rearing of Lepidopteran Insect- pests"	April 17-22, 1995	IAEA, Vienna & BATAN, Indonesia; Conducted at Natl. Atomic Energy Agency, Jakarta.
6	IAEA/FAO International Training Course on the Use of the Sterile Insect & Related Techn. for the Area-Wide Management of Insect Pests.	May 8 – June 19, 1996	IAEA/FAO ; Conducted at the University of Florida, Gainesville, USA
7	Workshop entitled, "Evaluation of Field Cages for Lepidoptera SIT Behaviour Assessments"	Nov. 21-22, 2010	Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture, held at Stellenbosch, South Africa
8	Workshop entitled "To Assess Quality Management Aspects of Lepidoptera Mass-produced for the Sterile Insect Technique in a Large Operational Setting"	Sept. 10-11, 2012	Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture, held at Phoenix, AZ USA
9	Workshop to "Standardize Sampling and Bioassay Methods for Assessing Field Performance of Sterile Male Lepidoptera".	August 29-30, 2016	Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture, held at South African Sugarcane Research Institute, Durban, South Africa.
10.	Workshop entitled, "Develop a Best Practice Manual on Field Performance of Sterile Male Moths".	17 March, 2018	Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture, held at Palmerston North, New Zealand



Signature of Faculty Member