

ALLAH BAKHSH

Head Seed Biotech Labs, Centre of Excellence in Molecular Biology
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Citations 4401 H Index 35 (Google Scholar) i10-index 86 (Google Scholar)

ACADEMICS

- BS (Hons) Agriculture (Plant Breeding and Genetics) 2004. University of Agriculture, Faisalabad, Pakistan, Thesis Title “Assessment of Kabuli and Desi Chickpea Cultivars based on Physio-morphological Parameters” **Thesis Supervisor, Prof. Dr. Tanvir A Malik**
- PhD. 2010 (Molecular Biology) Major in Agricultural Biotechnology. Thesis Title “Expression of two insecticidal genes in Cotton” Centre of Excellence in Molecular Biology (CEMB), University of the Punjab, Lahore, Pakistan. **Thesis Supervisor, Prof. Dr. Tayyab Husnain**

EMPLOYMENT HISTORY

- **June 2021 to onward:** Associate Professor, CEMB, University of the Punjab, Lahore, Pakistan (**Continued**)
- **January 2014 to June 2021:** Assistant Professor, Nigde Omer Halisdemir University, Turkey
- **Jan 2013-Dec 2013:** Postdoctoral research associate, University of Bologna, Italy.
- **Jan 2011-Jan 2013:** Postdoctoral research associate, University of Ankara, Turkey.

AS VISITING FACULTY/PROFESSOR

- **August 2023 onwards:** Department of Horticulture, Plant Protection and Quarantine, Kazakh National Agrarian University, Almaty, **Kazakhstan**.
- **September 2024:** Central Department of Biotechnology, Tribhuvan University, Kirtipur, **Nepal**.

CURRENT RESPONSIBILITIES

My current responsibilities as Head Seed Biotech Labs are to;

- To execute research projects funded by national (HEC, PSF) as well as international agencies (M.Y. Genetik, Antalya, Türkiye) as Principal Investigator.
- Deliver lectures to undergraduate and postgraduate students on agricultural biotechnology and plant protection and related subjects.
- Supervise MS and PhD thesis students in their research projects.
- Plan, manage, and monitor day-to-day activities of the Seed Biotech Labs.
- Ensure smooth functioning of laboratory operations, equipment, and facilities.
- Design and oversee experimental protocols and research workflows.
- Maintain lab safety standards and ensure compliance with institutional guidelines.
- Coordinate procurement and inventory of lab consumables and reagents.

- Serve as coordinate external linkages of the CEMB, University of the Punjab, Lahore
- Manage commercialization and regulatory affairs of agricultural products commercialized (Transgenic Cotton and Corn)

PUBLICATIONS

1. Gul A, Rao AQ, **Bakhsh A** (2026). Development of a Rapid and modified total RNA extraction method from polyphenolic-rich *Gossypium hirsutum*. *MethodsX*, p.103792. DOI: 10.1016/j.mex.2026.103792
2. Sadaqat S, Awais M, bin Tahir MS, Ajmal R, Yasmeen A, Azam S, Shahid N, Latif A, **Bakhsh A**, Mammadova R, Rao AQ (2026). Uncovering the Central Role of GhSPL13 in Vegetative Growth, Root Architecture, and Stress Responses in Cotton. *Plant Science* 371:113291. DOI: 10.1016/j.plantsci.2026.113291
3. Šućur R, Ali A, Mladenov V, Jocković B, Gou JY, Nadeem MA, **Bakhsh A**, Rehman R, Javed J, Aktas H, Ma J (2026). Molecular screening of Septoria tritici blotch resistance genes in European bread wheat cultivars using validated gene-specific SSR markers. *Phytopathology Research* 8(1):26. DOI: 10.1186/s42483-026-00411-2
4. Makhambetov A, Dairbekova Z, Dulat B, Sagitov A, Pozharskiy A, Kydyrbayev Y, **Bakhsh A**, Grissenko D (2026). Genetic Variation of Spongy Moth (*Lymantria dispar*) in Kazakhstan. *Insect* 17, 591, DOI: 10.3390/insects17060591
5. Nasir U, Yasmeen A, Awais M, Latif A, **Bakhsh A**, Ahmad N, Shahid N, Azam S, Rao AQ, Shahid AA. Multiplexed CRISPR/Cas9 mediated knockdown of BCH gene in potato enhances beta-carotene to combat Vitamin A Deficiency. *Plant Science* 113370, DOI:10.1016/j.plantsci.2026.113370
6. Zeng Q, Peng F, Wang J, Wang S, Lu X, **Bakhsh A**, Li Yan, Qaraevna BZ, Yin Z (2025). Identification of the MAP4K gene family reveals GhMAP4K13 regulates drought and salt stress tolerance in cotton. *Physiologia Plantarum* 177(1), p.e70031. DOI: 10.1111/ppl.70031
7. Dangol S, Barakate A, Caliskan ME, **Bakhsh A** (2025). Strain-dependent stability of pGreenII-based ternary construct in Escherichia coli. *Biologia* 80: 2885-2891 DOI: /10.1007/s11756-025-02026-y
8. Özkat GY, Aasim M, **Bakhsh A**, Amjad AS, Özcan S (2025). Machine learning models for optimization, validation, and prediction of light emitting diodes with kinetin based basal medium for in vitro regeneration of upland cotton (*Gossypium hirsutum* L.). *J Cotton Res* 8: 1-14. <https://doi.org/10.1186/s42397-025-00222-4>
9. Hashmi MH, Tariq H, Saeed F, Demirel U, Gökçe A, Merzendorfer H, Aksoy E, **Bakhsh A** (2024). Harnessing Plant-Mediated RNAi for Effective Management of *Phthorimaea absoluta* by Targeting *ACHE1* and *SEC23* Genes. *Plant Stress*, <https://doi.org/10.1016/j.stress.2024.100569>
10. Dangol SS, Çalışkan ME, **Bakhsh A** (2024). CRISPR-Cas9-mediated reduced expression of potato apoplastic invertase inhibitor gene and analysis of transformation efficiency parameters. *Potato Res*. DOI:10.1007/s11540-024-09818-w
11. Sattar MN, Naqqash MN, Rezk AA, Mehmood K, **Bakhsh A**, Elshafie H, Al-Khayri JM. Sprayable RNAi for silencing of important genes to manage red palm

- weevil, *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae). PloS one. 2024 Oct 24;19(10):e0308613
12. Gul A, Rao AQ, Ahmed M, Latif A, **Bakhsh A**, Iftikhar S (2024). The increased aspartate levels in transgenic cotton (*Gossypium hirsutum* L.) lead to improved tolerance against whitefly (*Bemisia tabaci*, Gennadius). *Physiologia Plantarum*, 176: e14491. DOI: 10.1111/ppl.14491
 13. Salim M, **Bakhsh A**, Naqqash MN, Gökçe A (2024). Heterologous expression of distinct insecticidal genes in potato cultivars encodes resistance against potato tuber moth, *Phthorimaea operculella* (Zeller)(Lepidoptera: Gelechiidae). *Journal of Plant Diseases and Protection* 14:1-3. DOI: 10.1007/s41348-024-00964-4
 14. Bajwa KS, Ali MU, Rao AQ, Kiani S, Ahmad F, **Bakhsh A**, Noor S, Abbas Z, Ali S, Ali GM (2024). From genes to fields: Environmental compatibility of herbicide tolerant transgenic cotton. *Industrial Crops and Products* 209, p.117903. DOI: 10.1002/fes3.494
 15. Choudry MW, Riaz R, Nawaz P, Ashraf M, Ijaz B, **Bakhsh A** (2024) CRISPR-Cas9 mediated understanding of plants' abiotic stress-responsive genes to combat changing climatic patterns. *Functional & Integrative Genomics* 24(4):1-23, DOI: 10.1007/s10142-024-01405-z
 16. Awais M, Rao AQ, Sadaqat S, Yaqoob A, Bhutta MS, Shakoor S, Yasmeen A, Ajmal S, Ghramh HA, Khan KA, **Bakhsh A** (2024). The regulatory landscape of genetically engineered crops in Pakistan. *Food and Energy Security* 13(1): e494. DOI: 10.1016/j.indcrop.2023.117903
 17. Bashir S, Yaqoob A, Bashir R, Bukhari S, Shahid N, Azam S, **Bakhsh A**, Husnain T, Shahid AA, Rao AQ (2024). Barley chitinase genes expression revamp resistance against whitefly (*Bemisia Tabaci*) in transgenic cotton (*Gossypium hirsutum* L.). *Journal of Cotton Research* 7(1):9. DOI:10.1186/s42397-024-00169-y
 18. Tekinsoy M, **Bakhsh A**, Çalışkan ME (2024). Expression of Jaburetox 2-Ec in potato encodes resistance against *Tuta absoluta* Meyrick (Lepidoptera: Gelechiidae). *Potato Research*. DOI: 10.1007/s11540-024-09788-z
 19. Suleimanova G, Kalibayev B, Tatyana, Yuri D, Bakhsh A (2024). Evaluating the Interaction of Ascochyta Blight and Fusarium Wilt in Chickpea Germplasm and their Impact on Agronomic Performance. *Pakistan Journal of Agricultural Sciences*, 61(3)
 20. Ali F, Arif M, Ali A, Nadeem M, Aksoy E, Bakhsh A, Khan SU, Kurt C, Tekdal D, Ilyas MK, Hameed A (2024). GWAS identifies genetic loci related to fatty acid and branched-chain amino acid metabolism and histone modifications under varying nitrogen treatments in safflower. *Functional Plant Biology* 51(5): FP23310. DOI: 10.1071/FP23310
 21. Salimov V, Mammadova R, Burak M, Alizade S, Sharifova S, Bakhsh A, Amrahov N, Hamidova M (2024). Inter simple sequence repeat (ISSR) based genetic and morphological polymorphism of Azerbaijani grape (*Vitis vinifera*) genotypes. *Genetic Resources and Crop Evolution*. DOI: 10.1007/s10722-024-02110-3
 22. Mammadova R, Akparov Z, Amri A, Bakhsh A, Alo F, Alizade S, Amrahov, Yunisova F (2024). Genetic diversity analysis of Azerbaijani bread wheat (*Triticum aestivum* L.) genotypes with simple sequence repeats markers linked to drought tolerance. *Genetic Resources and Crop Evolution*. DOI: 10.1007/s10722-024-01977-6

23. Cardi T, Murovec J, **Bakhsh A**, Boniecka J, Bruegmann T et al. (2023). "CRISPR/Cas-mediated plant genome editing outstanding challenges a decade after implementation". Trends in Plant Sciences 28:1114-1165. DOI: 10.1016/j.tplants.2023.05.012
24. Tariq H, Gökçe A, Aksoy E, Elçi E, **Bakhsh A** (2023). Exploring the efficacy of RNAi-mediated gene knock-down via oral delivery of dsRNA in the Colorado potato beetle (*Leptinotarsa decemlineata* Say). Turkish Journal of Zoology 47:492-504
25. Hossain MJ, **Bakhsh A**, Joyia FA, Aksoy E, Gökçe NZÖ, Khan MS (2023). Engineering of insecticidal hybrid gene into potato chloroplast genome exhibits promising control of Colorado potato beetle, *Leptinotarsa decemlineata* (Coleoptera: Chrysomelidae). Transgenic Research 36:497-512 DOI: 10.1007/s11248-023-00366-6.
26. Bayrıl BN, **Bakhsh A**, Nadeem MA, Demirel U (2023). Elucidating the genetic diversity and population structure of international cotton germplasm using inter-primer binding site (iPBS) retrotransposon marker system. Genetic Resources and Crop Evolution 71:1737-1748, DOI: 10.1007/s10722-023-01726-1
27. Liaqat A, Salisu IB, **Bakhsh A**, Ali Q, Imran A, Ali MA, Farooq AM, Rao AQ, Shahid AA (2023). A sub-chronic feeding study of dual toxin insect-resistant transgenic maize (CEMB-413) on Wistar rats. PloS one, 18(8), p.e0285090
28. Saeed F, Hashmi MH, Aksoy E, Demirel U, **Bakhsh A** (2023). Identification and characterization of RNA Polymerase II (RNAP) C-Terminal Domain Phosphatase-like 3 (SICPL3) in tomato under biotic stress. Molecular Biology Reports 50:6783-6793, DOI: 10.1007/s11033-023-08564-5
29. Naqqash MN, Gökçe A, Bakhsh A, Salim M (2023). Demographic features and population projection of resistant and susceptible populations of Colorado potato beetle, *Leptinotarsa decemlineata* (Coleoptera: Chrysomelidae). Phytoparasitica. 2023 Mar 17:1-0.
30. Rao AQ, Bajwa KS, **Bakhsh A**, Ali MA, Iqbal A, Latif A, Husnain T, Nasir IA, Shahid AA (2023). Evaluation of weed control efficiency of herbicide resistant transgenic cotton. Journal of Plant and Animal Sciences 33:75-84 DOI:10.36899/JAPS.2023.1.0596
31. Saeed F, Chaudhry UK, Raza A, Charagh S, **Bakhsh A** et al. (2023). Developing future heat-resilient vegetable crops. Functional and Integrative Genomics 23:47, DOI: 10.1007/s10142-023-00967-8
32. Yasmeen A, **Bakhsh A**, Ajmal S, Muhammad M, Sadaqat S, Awais M, Azam S, Latif A, Shahid N, Rao AQ (2023). CRISPR/Cas9-mediated genome editing in diploid and tetraploid potatoes. Acta Physiologiae Plantarum 45:32. DOI: 10.1007/s11738-022-03513-4
33. Tanveer S, Malik HA, Shahid N, Salis IB, Ahmed N, Latif A, Yasmeen A, Hassan S, **Bakhsh A**, Rao AQ (2023). Production of Proinflammatory cytokines by expressing Newcastle disease vaccine candidates in corn. Journal of King Saud University – Science 35: 102537 DOI: 10.1016/j.jksus.2022.102537
34. Aasim M, Ali SA, Aydin S, **Bakhsh A**, Sogukpinar C, Karataş M, Khawar KM, Aydin ME (2023). Artificial Intelligence-Based Approaches to Evaluate and Optimize Phytoremediation Potential of In vitro Regenerated Aquatic Macrophyte – *Ceratophyllum demersum* L. Environmental Science and Pollution Research 30: 40206–40217 DOI: 10.1007/s11356-022-25081-3

35. Yasmeen A, Shakoor S, Azam S, **Bakhsh A**, Shahid N, Latif A, Shahid AA, Husnain T, Rao AQ (2022). CRISPR-Cas-mediated knockdown of vacuolar invertase gene expression lowers the cold-induced sweetening in potatoes. *Planta* 256:107, DOI: <https://doi.org/10.1007/s00425-022-04022-x>
36. Hashmi MH, Saeed F, Demirel U, **Bakhsh A** (2022). Establishment of highly efficient and reproducible Agrobacterium mediated transformation system for tomato (*Solanum Lycopersicum* L.). *In Vitro Cellular & Developmental Biology Plant* 58:1066-1076, DOI: 10.1007/s11627-022-10300-w
37. Tariq M, Tabassum B, **Bakhsh A**, Farooq AM, Qamar Z, Akram F, Naz F, Rao AQ, Malik K, Nasir IA (2022). Heterologous expression of cryIIa12 insecticidal gene in cotton encodes resistance against pink bollworm, *Pectinophora gossypiella* (Lepidoptera: Gelechiidae); an alternate insecticidal gene for insect pest management. *Molecular Biology Reports* 49:10557-10564, DOI:10.1007/s11033-022-07824-0
38. Saeed F, Chaudhry UK, **Bakhsh A**, Raza A, Saeed Y, Bohra A, Varshney RK (2022). Moving beyond DNA sequence to improve plant stress responses. *Frontiers in Genetics* 929, DOI: 10.3389/fgene.2022.874648
39. Baloch FS, Aasim M, Mustafa Z, **Bakhsh A**, Katrici R, Nadeem MA, Ali SA, Akgur O, Chung SK (2022). Innovation in the breeding of common bean through a combined approach of in vitro regeneration and machine learning algorithms. *Frontiers in Genetics* 13:897696, DOI: 10.3389/fgene.2022.897696 (Impact Factor 4.77) Q2 Category
40. Kaleem Ullah RM, Gökçe A, **Bakhsh A**, Salim M, Wu HY, Naqqash MN (2022). Insight into use of eco-friendly synergists in resistance management of *Leptinotarsa decemlineata* (Coleoptera: Chrysomelidae). *Insects* 13:846, DOI: 10.3390/insects13090846 (Impact Factor 2.7) Q1 Category
41. Naeem MY, Jabran K, Özden M, **Bakhsh A** (2022). Assessment of morphological and biochemical characteristics of common purslane (*Portulaca oleracea* L.) accessions. *Pakistan Journal of Agricultural Sciences* 59:1017-1028 (Impact Factor 0.70) Q3 Category
42. Shad M, Yasmeen A, Azam S, **Bakhsh A**, Latif A, Shahid N, Din S, Sadaqat S, Rao AQ, Shahid AA (2021). Enhancing the resilience of transgenic cotton for insect resistance. *Molecular Biology Reports* 49:5315-5323, DOI: 10.1007/s11033-021-06972-z
43. Hossain J, Aksoy E, Gökçe ZNÖ, Joyia FA, Khan MS, **Bakhsh A** (2021). Rapid and efficient in vitro regeneration of transplastomic potato (*Solanum tuberosum* L.) plants after particle bombardment. *Turkish Journal of Agriculture and Forestry* 45:313-323
44. Gökçe ZNÖ, Aksoy E, **Bakhsh A**, Demirel U, Caliskan S, Caliskan ME (2021). Combined drought and heat stresses trigger different sets of miRNAs in contrasting potato cultivars. *Functional & Integrative Genomics* 21:489-502. DOI:10.1007/s10142-021-00793-w
45. Salim M, **Bakhsh A**, Gökçe A (2021). Stacked insecticidal genes in potatoes exhibit enhanced toxicity against Colorado potato beetle, *Leptinotarsa decemlineata* (Coleoptera: Chrysomelidae). *Plant Biotechnology Reports* 15: 197-215, DOI:10.1007/s11816-021-00668-3
46. Miladinovic D, Antunes MD, Yildirim K, **Bakhsh A**, Cvejić S, Kondić-Špika A, Jeromela AM, Sorteberg HO, Zambounis A, Hilioti Z (2021). Targeted plant

- improvement through genome editing: from lab to field. *Plant Cell Reports* 40:935-951, DOI: doi.org/10.1007/s00299-020-02655-4
47. Aasim A, Gökçe ZNO, **Bakhsh A**, Çaylı IT, Aksoy E, Çalışkan S, Çalışkan ME, Demirel U (2021). Individual and combined effect of drought and heat stresses in contrasting potato cultivars overexpressing miR172b-3p. *Turkish Journal of Agriculture and Forestry* 45:651-668, DOI:10.3906/tar-2103-60
 48. **Bakhsh A**, Hussain T, Rahamkulov I, Demirel U, Çalışkan ME (2020). Transgenic potato lines expressing CP4-EPSP synthase exhibit resistance against glyphosate. *Plant Cell Tissue and Organ Culture* 140:23-34
 49. Yavuz C, Tillaboeva S, **Bakhsh A** (2020). Apprehending the potential of BABY BOOM transcription factors to mitigate cotton regeneration and transformation. *Journal of Cotton Research* 3:1-14. DOI: 10.1186/s42397-020-00071-3
 50. **Bakhsh A** (2020). Development of efficient, reproducible, and stable *Agrobacterium*-mediated genetic transformation of five potato cultivars. *Food Technology and Biotechnology* 58:57-63.
 51. Naqqash MN, Gökçe A, Aksoy E, **Bakhsh A** (2020). Downregulation of imidacloprid resistant genes alters the biological parameters in Colorado potato beetle, *Leptinotarsa decemlineata* Say (chrysomelidae: Coleoptera). *Chemosphere* 240:124857 <https://doi.org/10.1016/j.chemosphere.2019.124857>
 52. Kavas M, Gökdemir G, Seçgin Z, **Bakhsh A** (2020). Ectopic expression of common bean ERF transcription factor PvERF35 promotes salt stress tolerance in tobacco. *Plant Biology* 22: 1102-1112. DOI: 10.1111/plb.13167
 53. Rahamkulov I, **Bakhsh A** (2020). Tissue specific and inducible promoters establish their containment of foreign gene expression in transgenic potatoes. *3 Biotech*. 10:426. doi.org/10.1007/s13205-020-02350-x
 54. Dangol SD, Yel Ilknur, Çalışkan ME, **Bakhsh A** (2020). Manipulating genome of diploid potato inbred line *Solanum chacoense* M6 using selectable marker gene. *Turkish Journal of Agriculture and Forestry* 44:399-407.
 55. Bakhsh A, Dangol SD, Naeem M, Azimi MH, Yasmeen A (2020). Genetic approaches for engineering biotic stress resistance in potato (*Solanum tuberosum* L). *Journal of Animal and Plant Sciences* 30: 1-17
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 57. Amir AN, **Bakhsh A** (2019). An effective pest management approach in potato to combat insect pests and herbicides. *3 Biotech*. 9: 16 DOI: 10.1007/s13205-018-1536-0
 58. Dangol SD, Barakate A, Stephends J, Çalışkan ME, **Bakhsh A** (2019). Genome editing of potato using CRISPR technologies: current development and future prospective. *Plant Cell Tissue and Organ Culture* 139:403-416
 59. Amin K, **Bakhsh A**, Gökçe AF (2019). Exploring the amenability of onions to *Agrobacterium* mediated transformation. *Journal of Animal and Plant Sciences* 29: 761-771
 60. Qamar Z, Tariq M, Rao AQ, **Bakhsh A** etc (2019). Trackable CEMB-Klean Cotton transgenic technology: Affordable climate neutral agri-biotech industrialization for developing countries. *Advancements in Life Sciences* 6:131-138
 61. Khabbazi SD, Khabbazi AS, Özcan SF, **Bakhsh A**, Başlama D, Özcan S (2018). Expression of GNA and biting site-restricted cry1Ac in cotton; an efficient

- attribution to insect pest management strategies. *Plant Biotechnology Reports* 12: 273-282
62. **Bakhsh A**, Dinç T, Hussain T, Demirel U, Aasim M, Caliskan ME (2018). Stacked Insecticidal Genes in Tobacco Lead to Appreciable Insect Resistance. *Turkish Journal of Biology* 42: 174-186
 63. Ahmed HA, Onarici S, **Bakhsh A**, Akdogan G et al. (2017). Targeted expression of insecticidal hybrid SN19 gene in potato leads to enhanced resistance against Colorado potato beetle (*Leptinotarsa decemlineata* Say) and tomato leaf miner (*Tuta absoluta* Meyrick). *Molecular Biology Reports* 11:315-329
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78. Bajwa KS, Shahid AA, Rao AQ, Kiani MS, Ashraf MA, Dahab AA, **Bakhsh A**, Latif A, Khan MAU, Puspito AN, Aftab A, Bashir A and Husnain T (2013). Expression of Calotropis procera expansin gene CpEXPA3 enhances cotton fibre strength. Australian Journal of Crop Sciences 7: 206-212.
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 83. Rao AQ, **Bakhsh A**, Nasir IA, Riazuddin S and Husnain T (2011). Phytochrome B mRNA expression enhances Biomass yield and physiology of cotton plants. African Journal of Biotechnology 10: 1818-1826.
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BOOKS PUBLISHED

- Çalışkan ME, **Bakhsh A**, Jabran K (2023). Potato Production Worldwide, Ist Edition. Academic Press, Elsevier Inc. ISBN: 9780128229255.
- **Bakhsh A**, Husnain T (2011). Expression of two insecticidal genes in Cotton: Development of transgenic cotton with sustained resistance against targeted insect pests. LAP LAMBERT Academic Publishing, ISBN: 9783844389203

BOOK CHAPTERS PUBLISHED

1. Arif U, Ashraf R, Ahmed H, Saleem M, **Bakhsh A** (2026). Metabolomics of Plant–Insect Interactions. In: Choudhury et al. (Eds) Exploring Plant Stress Tolerance, Vol 1. Apple Academic Press, pp. 367-381
2. Shamim Z, **Bakhsh A**, Shahid MN, Javed MA, Jamal A, Armstrong SJ (2026). New Frontiers in Meiotic Recombination to Develop Climate-resilient Crops. In Azhar et al. (Eds) Climate-Resilient Crops 2026, CRC Press, pp. 216-234
3. Shahid M, Fatima M, Nazik N, Gul A, Tariq M, Farooq AM, Arif U and **Bakhsh A**, (2026). Sterile Insect Technique (SIT) Enhanced with Genome Editing. In Genome Editing for Pest Management, CRC Press, pp. 121-131

4. Ambreen Gul, Shakoor S, Nazik N, Rao AQ, Mammadova R, Dangol S, **Bakhsh A** (2025). Designer Crops Developed against Insect Pests. In: Jain et al. (Eds) Custom-Designed Crop Breeding: Improved Traits, Vol 2 (1st Edition), John Wiley & Sons, Inc. ISBN:9781394192564 pp.689-708. <https://doi.org/10.1002/9781394192595.ch23>
5. Riaz S, Choudryh MW, Riaz R, Farooq AM, **Bakhsh A** (2025). Agrobacterium-Mediated Transformation of Soybean (*Glycine max* L.) using Split-Cotyledonary Explant. In: Stange Klein, C. (Eds) Agrobacterium. Methods in Molecular Biology, vol 2911. Humana, New York, NY. https://doi.org/10.1007/978-1-0716-4450-8_8
6. Barpete, S. et al. (2025). Application of Next-Generation Breeding Tools in Minor Pulses for Major Impact: A Way Ahead. In: Pandey, M.K., Mallikarjuna, M.G., Lohithaswa, H.C., S. Aski, M., Gupta, S. (eds) Breeding Climate Resilient and Future Ready Pulse Crops. Springer, Singapore. https://doi.org/10.1007/978-981-96-0483-8_11
7. Nazik N, Amin A, Yin Z, Mammadova R, Suleimanova G, Rao AQ, **Bakhsh A** (2025) CRISPR/Cas-Mediated Genetic Improvements in Vegetable Crops. In: Chaudhry, U.K., Öztürk, Z.N., Gökçe, A.F. (eds) Drought Stress. Springer, Cham, ISBN 978-3-031-80610-0, pp. 347-368, https://doi.org/10.1007/978-3-031-80610-0_13
8. **Bakhsh A**, Nazik N, Riaz R, Saeed R, Choudry MW, Ali S, Huma Z, Sajjad MN, Suleimanova G, Rao AQ (2024) CRISPR-Cas-mediated genome editing in tomatoes and potatoes. In: Abd-Elsalam KA, Ahmad A, Zhang B (eds) CRISPRized Horticulture Crops. Academic Press, ISBN: 9780443132292, pp. 265-276, <https://doi.org/10.1016/B978-0-443-13229-2.00020-X>
9. Prestwich BD, Cardi T, **Bakhsh A**, Nicolai A, Bhati KK (2024). Novel Delivery Methods for CRISPR-Based Plant Genome Editing. In: Ricroch, A, Eriksson D, Miladinović D, Sweet J, Van Laere K, Woźniak-Gientka E (eds) A Roadmap for Plant Genome Editing. Cham: Springer Nature Switzerland, ISBN 978-3-031-46149-1, pp. 41-67 https://doi.org/10.1007/978-3-031-46150-7_3
10. Dervishi A, Choudry MW, Riaz R and **Bakhsh A** (2024). Genetic Improvement in Leguminous Crops Through Genome Editing. In: Ricroch, A, Eriksson D, Miladinović D., Sweet J, Van Laere K, Woźniak-Gientka E (eds) (eds) A Roadmap for Plant Genome Editing. Cham: Springer Nature Switzerland, ISBN 978-3-031-46149-1, pp. 259-269. https://doi.org/10.1007/978-3-031-46150-7_16
11. Khalid S, Nadeem A, Shaheen S, Mammadova R, **Bakhsh A** (2023) Crop protection for sustainable agriculture in the era of climate change. In: Hasanuzzaman M (eds) Climate-Resilient Agriculture, Vol 1: Crop Responses and Agroecological Perspectives. Springer, Cham International Publishing, ISBN: 978-3-031-37424-1, pp. 349-361. https://doi.org/10.1007/978-3-031-37424-1_17
12. Yel I, Dönmez BA, Yeşil B, Tekinsoy M, Saeed F, **Bakhsh A** (2023) Doubled haploid production – mechanism and utilization in plant breeding. In: Raina, A., Wani, M.R., Laskar, R.A., Tomlekova, N., Khan, S. (eds) Advanced Crop Improvement, Volume 1: Theory and Practice, Springer, Cham International Publishing, ISBN: 978-3-031-28146-4, pp. 321–347, https://doi.org/10.1007/978-3-031-28146-4_13
13. Khalid S, Siddique R, **Bakhsh A** (2023) Smart plant breeding for potato in the post-genomics era. In: Singh, S., Sharma, D., Sharma, S.K., Singh, R. (eds) Smart Plant

Breeding for Vegetable Crops in Post-genomics Era. Springer Singapore, ISBN: 978-981-19-5367-5, pp. 337-357, https://doi.org/10.1007/978-981-19-5367-5_13

14. Saeed F, Dangol SD, Hashmi MH, Hossain MJ, **Bakhsh A** (2023) Role of genetic engineering in improving potato production. In: Caliskan ME, Bakhsh A, Jabran A (eds) Potato Production Worldwide (Ist Edition). Academic Press, Elsevier Inc. ISBN: 9780128229255, pp. 303-315, <https://doi.org/10.1016/B978-0-12-822925-5.00006-2>
15. **Bakhsh A**, Jabran K, Nazik N, Çalışkan ME (2023) Conclusion and future prospective in potato production. In: Caliskan ME, Bakhsh A, Jabran A (eds) Potato Production Worldwide (Ist Edition). Academic Press, Elsevier Inc. ISBN: 9780128229255, pp. 457-470, <https://doi.org/10.1016/B978-0-12-822925-5.00004-9>
16. **Bakhsh A**, Zainab R, Ali MA, Chung G, Golokhvast KS, Nawaz MA (2023) Genetically modified organism in Europe: state of affairs, birth, research and regulatory process(es). In Nawaz M, Chung G, Golokhvast KS, Tsatsakis A (Eds) GMOs and Political Stance (Ist Edition). Academic Press 2022, Elsevier Inc. ISBN: 9780128239049, pp.165-172, <https://doi.org/10.1016/B978-0-12-823903-2.00012-3>
17. **Bakhsh A**, Hossain J, Yerlikaya BA, Ayten S, Özcan S (2023) An overview of regulations of genetically modified organisms in Türkiye. In Nawaz M, Chung G, Golokhvast KS, Tsatsakis A (Eds) GMOs and Political Stance (Ist Edition). Academic Press 2022, Elsevier Inc. ISBN: 9780128239049, pp.193-230, <https://doi.org/10.1016/B978-0-12-823903-2.00003-2>
18. Yaman C, Khalid S, **Bakhsh A** (2022) Dormancy and germination of salvia species: An overview. In: Özyazici G (editor) New Developments and on Medicinal and Aromatic Plants-II. Iksad Publishing House, ISBN: 978-625-8213-33-1, pp. 321-356
19. Rana IA, **Bakhsh A**, Tillaboeva S, Arsh Q, Haihong S, Baig IA, Azhar MT (2021) Genetically modified cotton; boom or dust. In: Khan Z, Ali Z, Khan AA (eds) Cotton Breeding and Biotechnology. CRC Press Taylor and Francis Group 33 B/W Illustrations, ISBN 9780367562229, pp.271-289 <https://doi.org/10.1201/9781003096856-16>
20. Aksoy E. Demirel U, **Bakhsh A**, Zia MAB, Saeed F, Çalışkan S, Çalışkan M (2021) Recent advances in potato (*Solanum tuberosum* L.) breeding. In: Al-Khayri J.M., Jain S.M., Johnson D.V. (eds) Advances in Plant Breeding Strategies: Vegetable Crops. Springer, Cham. ISBN: 978-3-030-66965-2, https://doi.org/10.1007/978-3-030-66965-2_10
21. Hossain J, Tillaboeva S, Sirel IA, Kaya RB, Dönmez BA, Aasim M, **Bakhsh A** (2021) Genetic Engineering of ion transporter for osmotic stress tolerance. In Roychoudhury A, Tripathi DK, Deshmukh R (Eds) Transporters and Plant Osmotic Stress, Academic Press, Elsevier Inc. pp. 133-166, <https://doi.org/10.1016/B978-0-12-817958-1.00011-6>
22. Dangol SD, Hashmi MH, Saeed F, Yel I, Öztürk A, **Bakhsh A** (2021) Utilizing RNA based approaches to understand plant-insect interactions. In Tang G et al. (eds) RNA-Based Technologies for Functional Genomics in Plants, Springer International Publishing. ISBN: 978-3-030-64994-4, pp. 393–428. <https://doi.org/10.1007/978-3-030-64994-4>
23. **Bakhsh A**, Sirel IA, Kaya RB, Ataman IH, Tillaboeva S, Dönmez BA, Yeşil B, Yel I, Tekinsoy M, Duru E (2021) Contribution of genetically modified crops in agricultural production: success stories. In Singh P et al. (eds) Policy Issues in Genetically

Modified Crops, a Global Perspective. Academic Press, Elsevier Inc. <http://dx.doi.org/10.1016/B978-0-12-820780-2.00006-6>

24. Maqbool A, **Bakhsh A**, Aksoy E (2021) Effects of natural variations on of Biofortification. In: Azhar MT and Wani S (eds) Wild Germplasm for Genetic Improvement in Crop Plants. Academic Press, Elsevier Inc. <https://doi.org/10.1016/B978-0-12-822137-2.00007-2>
25. Hossain MJ, **Bakhsh A** (2020) Development and applications of transplastomic plants; a way towards eco-friendly agriculture. In: Fahad S. et al. (eds) Environment, Climate, Plant and Vegetation Growth. Springer, Cham. https://doi.org/10.1007/978-3-030-49732-3_12
26. Maqbool A, Abrar M, **Bakhsh A**, Çalışkan S, Khan HZ, Aslam M, Aksoy E (2020) Biofortification under climate change: The fight between quality and quantity. In: Fahad S. et al. (eds) Environment, Climate, Plant and Vegetation Growth. Springer, Cham. https://doi.org/10.1007/978-3-030-49732-3_9
27. Saeed F, Hashmi MH, Hossain MJ, Ali MA, **Bakhsh A** (2020) Transgenic technologies for efficient insect pest management in crop plants. In: Kiran U, Abidin MZ, Kamaluddin (eds) Transgenic Technology Based Value Addition in Plant Biotechnology. Academic Press, Elsevier Inc. <https://doi.org/10.1016/B978-0-12-818632-9.00006-X>
28. Salim M., Gökçe A., Naqqash M.N., **Bakhsh A**. (2020) Gene Pyramiding: An Emerging Control Strategy against Insect Pests of Agronomic Crops In: Hasanuzzaman M. (eds) Agronomic Crops Vol 3. Springer, Singapore https://doi.org/10.1007/978-981-15-0025-1_16
29. Ozturk Gokce Z.N. et al. (2020) Abiotic Stress Tolerance in Field Crops: Integration of Omics Approaches. In: Hasanuzzaman M. (eds) Agronomic Crops Vol 3. Springer, Singapore https://doi.org/10.1007/978-981-15-0025-1_24
30. Sattar MN, Iqbal Z, Dangol SD, **Bakhsh A** (2019) CRISPR/Cas9: A new genome editing tools to Accelerate Cotton Breeding. In Advances in Plant Breeding Strategies: Nut and Beverage Crops Vol 4 Edited by Al-Khayri MJ, Jain SM, Dennis V. Springer International Publishing ISBN: 978-3-030-23112-5, DOI: 10.1007/978-3-030-23112-5
31. Jabran K, Sami U, Chauhan BS, **Bakhsh A** (2019) An Introduction to Global Production Trends and Uses, History and Evolution, and Genetic and Biotechnological Improvements in Cotton. In Cotton Production, World Agriculture Series Edited by Jabran K and Chauhan BS. John Wiley and Sons Publishers ISBN: 1119385490, 9781119385493.
32. Aasim M, Khawar KM, Karataş M, Bloch FS, **Bakhsh A** (2019) An Insight to Micropropagation of Freshwater Aquatic Medicinal Plants. In: Ozturk M., Hakeem K. (eds) Plant and Human Health, Volume 2. Springer, Cham. ISBN 978-3-030-03344-6, pp 425-445
33. Aasim M, Sameeullah M, Karataş M, Bakirci S, **Bakhsh A**, Akhtar MS (2019) An Insight into Biotechnological Approaches Used for the Improvement of Secondary Metabolite from the medicinal Aquatic Plant, Water Hyssop (*Bacopa monnieri* L.). In: Akhtar MS, Swamy MK (eds) Natural Bio-active Compounds. Springer, Singapore. ISBN 978-981-13-7438-8, pp 123-152.

34. Aasim M., Baloch F.S., Nadeem M.A., **Bakhsh A.**, Sameeullah M., Day S. (2018) Fenugreek (*Trigonella foenum-graecum* L.): An Underutilized Edible Plant of Modern World. In: Ozturk M., Hakeem K.R., Ashraf M., Ahmad MSA. (eds) Global Perspectives on Underutilized Crops. Springer Nature. ISBN 978-3-319-77776-4, pp. 381-408
35. Aasim M., **Bakhsh A.**, Sameeullah M., Karataş M., Khawar K.M. (2018) Aquatic Plants as Human Food. In: Ozturk M., Hakeem K., Ashraf M., Ahmad MSA. (eds) Global Perspectives on Underutilized Crops. Springer Nature. ISBN 978-3-319-77776-4, pp. 165-187
36. Aasim M, Baloch FS, **Bakhsh A**, Sameeullah M, Khawar KM (2018) Biotechnological approaches for genetic improvement of Fenugreek (*Trigonella foenum-graceum* L.). In Kumar N (ed) Biotechnological Approaches for Medical and Aromatic plants. © Springer Nature Singapore, ISBN 978-981-13-0535-1, pp. 417-444
37. Aasim M, Sameeullah M, **Bakhsh A**, Siviñç C, Day S, Khawar KM (2018) Plant Tissue Culture and Genetic Transformation Studies of Poor Man Crop Cowpea (*Vigna Unguiculata* L.). In Nikolic BA (ed) Cowpea Research Progress and Management Challenges. © 2018 Nova Science Publishers, Inc. ISBN: 978-1-53614-282-2, pp. 65-96.
38. **Bakhsh A**, Baloch FS, Hatipoğlu R, Özkan H (2015) Use of genetic engineering: benefits and health concerns. In Handbook of Vegetable Preservation and Processing, 2nd Edition Edited by Hui YH, Evranuz EÖ. CRC Press Taylor and Francis Group, 110 B/W Illustrations. ISBN 9781482212280.

RESEARCH PROJECTS

Grants Received as Principal Investigator

- **Project Leader**, Development of tomato lines resistant to tomato brown rugose fruit virus. A project awarded by M.Y. Genetiks Antalya Türkiye, 2023-2024, Budget 25,000 USD (**Continued**)
- **Project Leader**, Development of highly efficacious sucking and chewing insect resistant cotton prototype for commercialization (HEC TDF-04-300) Awarded by Higher Education Commission, Pakistan, 2025-2026, Budget 9.3 million PKR (**Continued**)
- **Project Leader**, Genetic basis of Resistance in Pink bollworm and Weeds in Three-Gene Cotton Fields of Punjab Province and mitigation Strategies to delay resistance (25-885). Project awarded by Punjab Agriculture Research Board (PARB), 2026-2029, Budget 21.95 million PKR (**Continued**)
- **Project Leader**, Integrating Biotechnology for Resilient and Locally Adapted Potato Varieties. Awarded as Natural Sciences Linkage Programme (NSLP) by Pakistan Science Foundation, 2026-2029, project Budget 8.00 million PKR (**Completed**)
- **Project Leader**, A Non-GM, Eco-friendly and Cost-effective dsRNA based Biopesticide to Control Cotton Pink bollworm (*Pectinophora gossypiella*) (PSDP Project#302) (2025). Awarded by Pakistan Academy of Sciences, Budget 12.105 million PKR (**Continued**)
- **Project Leader**, Production of insect resistant transplastomic potato lines against Colorado potato beetle and Potato tuber moth (TOVAG 216O027). 2017-2020. Budget 304,140 TL. A bilateral Project with University of Agriculture, Faisalabad, Pakistan supported by TUBITAK, Türkiye and Pakistan Science Foundation, Pakistan (**Completed**).

- **Project Leader**, A novel Plant mediated RNAi strategy to develop insect resistant potato lines against Colorado Potato Beetle and Potato Tuber Moth (TOVAG 215O520). 2016-20. Budget 306, 270.00 TL. TÜBITAK (**Completed**).
- **Project Leader**, Development of herbicide resistant potato lines (TOVAG 115O022). 2015-17. Budget 100,000.00 TL. TÜBITAK (**Completed**)
- **Project Leader**, Development of broad-spectrum insect-resistant tobacco cultivars using gene pyramiding strategy. 2014-15. Awarded by Scientific Research and Project Units (FEB314/10-BAEP6), Niğde Omer Halisdemir University, Türkiye (**Completed**).
- **Project Leader**, Transformation of a R2R3-MYB Gene in Potato against biotic stress (2020-21). Awarded by Scientific Research and Project Units (BAP), Niğde Omer Halisdemir University, Türkiye. Project Budget (30,000 TL) (**Completed**).
- **Project Leader**, Silencing some important genes of *Tuta absoluta* (Lepidoptera: Gelechiidae) with plant-mediated RNAi Technology (2020-22). Scientific Research and Project Units (BAP), Niğde Omer Halisdemir University, Türkiye Project Budget (15000 TL) (**Completed**).
- **Project Leader**, Assessment of Genetic Diversity of Cotton Genotypes (*Gossypium hirsutum* L.) Using the iPBS Marker System (TGT 2020/22-LÜTEP), Budget 7500 TL (**Completed**)

Participation as Researcher (Co-Principal Investigator)

- **Co-PI**, Development of cotton lines with economic traits and resistance to wilting diseases (2024-2027). Awarded Islamic Development Bank (IsDB), Jeddah, KSA, Project Budget 150,000 USD (**Continued**)
- **Co-PI**, Integrated Management of Fruit Flies in Peach Orchards Using RNAi-Mediated Gene Silencing and Biocontrol Agents: A Sustainable Approach. (Grant No. NRPU 113868-149), Awarded by Higher Education Commission, Islamabad, 2026-27, Project Budget 7.3 million PKR.
- **Co-PI**, CRISPR/cas 9 mediated knock out of LOV1 and AOS2 genes to impart biotic stress resistance in potato (*Solanum tuberosum*), Awarded by Higher Education Commission 2024-26, CPEC-CRG2-386, Project Budget 12.9 million PKR (**Continued**)
- **Co-PI**, Development of Climate Resilient cotton resistant to drought and heat through editing of negative regulators by using Cpf1 multiplex system (2023-2025). Awarded by Pakistan Science Foundation (PSF), Project Budget 5.045 million PKR (**Continued**).
- **Researcher**, Investigation of the Role of GATA12 in Regulation of Iron Deficiency Signaling in *Arabidopsis thaliana*, 2019-2021. Awarded by “The Scientific and Technological Council of Türkiye (TUBITAK)”. Project Budget (360,240.00 TL) (**Completed**).
- **Researcher**, Development of novel screening tools to identify Potato Genotypes with low acrylamide potential (Depola) (TOVAG 115O949) 2017-20. Awarded by “The Scientific and Technological Council of Türkiye (TUBITAK)”. Project Budget (358,700.00 TL) **A bilateral Project with Germany (Completed)**.
- **Researcher**, Identification of miRNAs and their functions regulating drought and heat tolerance of potato (TOVAG 115O405). 2015-18. Awarded by “The Scientific and Technological Council of Türkiye (TUBITAK)”. Project Budget (359,240.00 TL) (**Completed**).

- **Co-PI/Researcher**, Comparison of agricultural and economic productivity of potato minitubers produced in soil and without soil production systems. 2015-2017. Awarded by Doğuř Agricultural Research and Development Private Limited. Project Budget (213,500.00 TL) (**Completed**).
- **Co-PI/Researcher**, Improving Processing Potato lines using conventional plant breeding and molecular markers techniques. 2014-17. Awarded by Ministry of Food, Agriculture and Livestock (TAGEM-14/AR-GE/38), Türkiye. Project Budget (186,211.00 TL) (**Completed**).
- **Co-PI/Researcher**, Use of Gene Silencing Techniques (RNAi) in control of Colorado potato beetle, [*Leptinotarsa decemlineata* (Chrysomelidae: Coleoptera)]. 2017-20. Awarded by Doğuř Agricultural Research and Development Private Limited. Project Budget (60,000 TL) (**Completed**).
- **Co-PI/Researcher**, Determination of genetic and biological properties of a new virus detected by New Generation Sequencing (NGS) of grapevine 2019-2021 (TGT 2019/06-BAGEP). Awarded by Scientific Research and Project Units (BAP), Niğde Omer Halisdemir University, Türkiye. Project Budget (29,984.43 TL) (**Completed**).
- **Co-PI/Researcher**, Control of *Leptinotarsa decemlineata* (Say) and *Phthorimaea operculella* Zeller with pyramiding of insecticidal genes in potato. 2017-20. Awarded by Scientific Research and Project Units (BAP), Niğde Omer Halisdemir University, Türkiye. Project Budget (20,000.00 TL) (**Completed**).
- **Co-PI/Researcher**, Determining Production of Alkanin/Şikonin (A/S) Metabolites in *Alkanna orientalis* (L) Boiss. var. *orientalis* and *Alkanna sieheana* Rech. Fil. by *Agrobacterium rhizogenes* mediated transformation. 2018-2020. Awarded by Scientific Research and Project Units (BAP), Bozok University, Yozgat, Türkiye. Project Budget (13,934.00 TL) (**Completed**).
- **Co-PI/Researcher**, *Agrobacterium tumefaciens* Mediated Genetic Transformation in Aquatic Plants. 2014-16. Awarded by Scientific Research and Project Units (BAP: 03-M-14), Karamanoğlu Mehmet Bey University, Karaman, Türkiye. Project Budget (19,993.00 TL) (**Completed**).
- **Co-PI/Researcher**, Overexpression studies PCS1 gene in *Ceratophyllum demersum* to investigate its phytoremediation Potential. 2017-19. Awarded by Scientific Research and Project Units (BAP), Necmettin Erbakan University, Konya, Türkiye. Project Budget (50,000.00 TL) (**Completed**).

Participation in Projects as Consultant

- **Advisor**, Genome editing of local rice cultivar to develop blast resistant lines. Awarded by **University Grants Commission Nepal-** Collaborative Research and Innovation Grant (UGC-CRIG) Award (Grant Number: CRIG-78/79-S&T-08), Project Budget 56526 USD (**Continued**).
- **Advisor**, improving dsRNA efficiency against Potato Beetle (*Leptinotarsa Decemlineata* Say.) using mineral-based nanocomposites (TOVAG 2230259). 2024-2027. Grant awarded by **TÜBİTAK**, Türkiye with budget (1 million TL)

Participation in COST-ACTIONS

- **CA18111-European Co-operation in Science and Technology (COST)**, MC member (substitute) from Türkiye. - Genome editing in plants - a technology with transformative potential (PlantEd). 2019-2023. Cost Action Chair, Prof. Dr. Dennis Eriksson, Swedish University of Agricultural Sciences, Alnarp/Sweden (**Completed**).
- **CA15223-European Co-operation in Science and Technology (COST)**, Participating member from Türkiye– Modifying plants to produce interfering RNA

(iPLANTA). 2016-2021. Cost Action Chair, Prof. Dr. Bruno Mezzetti, Marche Polytechnic University, Ancona, Italy (**Completed**).

- **CA22157-European Co-operation in Science and Technology (COST)**, Participating member from Pakistan. Reproductive enhancement of crop resilience to extreme climate (RECROP). 2023-2027. Cost Action Chair, Prof. Dr. Sotirios Fragkostefanakis, Goethe University Frankfurt, Germany (**Continued**).

PROFESSIONAL TRAINING/WORKSHOPS

- Two days international training entitled “Pakistan Biosafety Capacity Building Programme on Biotech Innovation, Biotech Regulation and their Impacts” on 24-25th January 2024 organized by University of Missouri, Colombia, USA and The Sustainable Development Policy Institute (SDPI), Pakistan in **Dubai, United States of Emirates**.
- Two days training international workshop entitled "Bridging the Gap: Enhancing Biosafety and Biosecurity Regimes for a Secure Future", on 3-4 December 2023 organized by COMSTECH and Republic of Kazakhstan at COMSTECH Secretariat, Islamabad, **Pakistan**
- Two days training workshop “Patent and Plant Breeder Rights Application Drafting” on 31st May-1st June 2023 organized by National Institute for Genomics and Advance Biotechnology (NIGAB), PARC-NARC, Islamabad, **Pakistan**
- Four days capacity building workshop for effective reporting and implementation of Cartagena Protocol on Biosafety, UNEP-GEF Project For Sustainable Capacity Building for Effective Participation in the BCH (BCH-III) organized by Ministry of Climate Change on 20-23 February 2023, Islamabad, **Pakistan**
- International three days’ workshop on “Science Communication and Community Engagement organized by COMSTECH and Ministry of Foreign Affairs in collaboration with Technology Times, Regional Rapport, and Pakistan Biotechnology Information Centre (PABIC) on 1-3 February 2023 at COMSTECH, Islamabad, **Pakistan**.
- COMCEC-COMSTECH training and workshop on new breeding technologies for food and nutritional security on 30th Nov-2nd December 2021, organized by Middle East Technical University, Ankara, **Türkiye**
- ICGEB-JRC Workshop "Genome Editing Applications and Beyond" 19-20 November 2019 | Trieste – **Italy**
- International Workshop on “Use of Genome Editing & Other New Breeding Technologies for Global Food Security” arranged by COMSTECH-ICGEB-NIBGE from April 8-10, 2019 at COMSTECH, Islamabad, **Pakistan**
- Course on Map Construction and QTL Analysis in Plants organized by University of Copenhagen, 14-18th Nov2011, **Denmark**
- Three Months training in mutation breeding at Nuclear Institute for Agriculture and Biology (NIAB) on May-July 2004, Faisalabad. **Pakistan**

CONFERENCES/WORKSHOPS/SEMINARS ORGANIZED

- CEMB International Cotton Conference, In Celebration of World Cotton Day on 07-08 October 2025 at CEMB, University of the Punjab, Lahore.
- Two days training workshop on CRISPR/Cas systems in Genome Editing: A hands-on training workshop on 17-19 June, 2025 at CEMB, University of the Punjab, Lahore.
- Organized international Conference on Trends and Challenges in Health Sciences on 01-02 March 2023 at CEMB, University of the Punjab, Lahore.

- Hands on Training Workshop on Structural Bioinformatics Tools on February 2023 at CEMB, University of the Punjab, Lahore, Pakistan
- International Conference on Plant Molecular Biology (ICPMB) on 14-15 December 2022 at CEMB, University of the Punjab, Lahore.
- 4th International Symposium on Advances in Molecular Biology of the Plants and Health Sciences, 23-24 December 2021 at CEMB, University of the Punjab, Lahore.
- CEMB Cotton Seminar, Success, Challenges and Future Directions on 22 March 2022 at CEMB at CEMB, University of the Punjab, Lahore.
- National Seminar “Awareness seminar on GM soybean and potential of Soybean cultivation in Pakistan” on January 23, 2023 at CEMB, University of the Punjab, Lahore.

AWARDS, FELLOWSHIPS

- UNESCO-TWAS sponsored fellowship for scientific visit to Tribhuvan University, Kathmandu, 2024, Nepal
- Early-Stage Research Fellowship (2013) awarded by University of Bologna, Italy.
- Postdoctoral Fellowship awarded by TUBITAK (Scientific and Technological Research Council of Türkiye), Ankara, Türkiye
- Indigenous PhD scholarship (2006) awarded by Higher Education Commission, Islamabad, Pakistan.

COURSES TAUGHT

MS/PhD Courses (Both in Fall and Spring Semester)

- AGE7103 Analysis of Genes and Genomes in Plants (average 10 students)
- AGE6113 Tissue Culture in Plant Breeding (average 10 students)
- AGE6101 Genetically Modified Plants (average 10 students)
- AGE6108 Haploids in Plant Breeding (average 10 students)
- AGE6112 Functional Genomics in Plant Breeding (average 10 students)
- AGE7102 Gene Transfer Techniques in Plants (average 10 students)
- CEMB 502 Biotechnology (at CEMB, average 40 students)
- CEMB 505 Biostatistics and Bioinformatics (at CEMB, average 40 students)
- CEMB 708 Plant Production and Protection (at CEMB, average 25 students)
- CEMB-707 Advances in Genetically Modified Organism (average 25 students)

Undergraduate Courses (Both in Fall and Spring Semester)

- TGM3005 Plant Genetic Engineering (average 30 students)
- TGM4035 Biosafety (average 30 students)
- TGM2010 Plant Cell Tissue and Organ Culture (average 30 students)
- TGM3044 Recombinant DNA Technology (average 30 students)
- TGM4062 Breeding for Biotic Stress (average 30 students)

STUDENT ADVISORY

PhD Student (Graduated)

- **Duha Mysire Majeed** (2025) Cloning of 5-EnolPyruvalShikimate-3-Phosphate Synthase (*EPSPS*) gene in potato (*Solanum tuberosum* L.) for conferring resistance to glyphosate herbicide. Department of Biotechnology, **University of Baghdad, Iraq**
- **Faisal Saeed** (2024) Developing mutants of negative regulator of immune response gene (CPL-3) in tomato using CRISPR-Cas9. **Nigde Omer Halisdemir University, Türkiye**

- **Muneeb Hassan Hashmi** (2022) Plant mediated RNAi strategy to develop resistant tomato lines against Potato Tuber Moth. **Nigde Omer Halisdemir University, Türkiye**
- **Md. Jakir Hossain** (2021) Development of insect resistant transplastomic potato lines against colorado potato beetle (*Leptinotersa decemlineata*). **Nigde Omer Halisdemir University, Türkiye**
- **Sarbesh Das Dangol** (2021) Knockdown of Potato Invertase Inhibitor gene by CRISPR/Cas9 based approach, **Nigde Omer Halisdemir University, Türkiye**

PhD Students (Continued)

- **Noman Nazik** (2021-26) Development of tomato lines resistant to Tomato brown rugose fruit virus (ToBRV). CEMB, University of the Punjab, Lahore, Pakistan
- **Amina Amin Chaudhry** (2022-27). Use of different transgenic approaches to develop tomato lines resistant to insect pests. CEMB, University of the Punjab, Lahore, Pakistan
- **Muniba Shahid** (2023-28). dsRNAs Based Control of Cotton Bollworms, University of the Punjab, Lahore, Pakistan
- **Muhammad Abbas Khan** (2022-25). CRISPR-Cas based genome editing approach to knock out invertase inhibitor gene in potatoes. Institute of Biochemistry and Biotechnology, PMAS Arid Agriculture University, Rawalpindi, Pakistan
- **Sumbal Mirza** (2022-2027). Development of potato lines expressing fungus tolerant genes in plastids. Centre of Advance Biochemistry and Biotechnology (CABB), Faculty of Agriculture, University of Agriculture, Faisalabad, Pakistan
- **Prince Charles Kulekey** (2024-28). Development of broad spectrum resistance lines of Bambara Groundnut (*Vigna subterranean* L.) against potyviruses using CRISPR-Cas mediated Genome editing. Department of Plant Production and Technologies, Faculty of Agricultural Sciences and Technologies, Nigde Omer Halisdemir University, Nigde, Türkiye.
- **Jawad ul Hassan** (2024-2029). Introgression of some elite characters against biotic stress into potato cultivars. CEMB, University of the Punjab, Lahore, Pakistan

MS Students (Graduated)

- **Toga Dinç** (2016). Development of insect resistant tobacco lines expressing *cry1Ac* and *cry2a* genes. Nigde Omer Halisdemir University, Türkiye
- **Safa Sümer** (2018). *Agrobacterium tumefaciens* mediated gene transformation of potato with herbicidal gene (CP4-EPSPS), Nigde Omer Halisdemir University, Türkiye
- **Abdul Naser Amiri** (2018). Development of transgenic potato lines expressing insecticidal and herbicidal gene, Nigde Omer Halisdemir University, Türkiye
- **Ilhom Rahamkulov** (2019). Comparison of different promoters' activity in transgenic potato, Nigde Omer Halisdemir University, Türkiye
- **Ayça Betül Dönmez** (2020). Optimization of *in vitro* regeneration of different soybean cultivars, Nigde Omer Halisdemir University, Türkiye
- **İrem Aycan SIREL** (2021). Overexpression of SLAIMI gene encoding R2R3 MYB transcription factor in potato under drought conditions. Nigde Omer Halisdemir University, Türkiye
- **Shakhnozakhon TILLABOEVA** (2021). Overexpression of Baby Boom gene in cotton to enhance somatic embryogenesis, Nigde Omer Halisdemir University, Türkiye

- **Rabia Busenaz GÜNDÜZ** (2021). Transformation of a R2R3-MYB gene in potato against biotic stress. Nigde Omer Halisdemir University, Türkiye
- **Binnur Yeşil** (2022). Evaluation of genetic diversity of cotton genotypes (*Gossypium hirsutum* L.) using iPBS marker system, Nigde Omer Halisdemir University, Türkiye
- **Merve Tekinsoy** (2022). Overexpression of Jaburetox 2-Ec in Potato (*Solanum Tuberosum* L.), Nigde Omer Halisdemir University, Türkiye
- **Saqib Ali** (2023). Optimization of in vitro culture and genetic transformation in local soybean cultivars, University of the Punjab, Lahore, Pakistan
- **Zille Huma** (2023). Development of dsRNA based biopesticide against cotton dusky bug, *Oxycarenus hyalinipennis* Costa (Lygaeidae: Hemiptera), University of the Punjab, Lahore, Pakistan
- **Muhammad Waqas Choudry** (2024). Optimization of CRISPR/Cas9-based Gene Knockout in Soybean (*Glycine max* L.) – targeting AtPQT3 and AtPAR1 Homologs for Paraquat Tolerance Trait. University of the Punjab, Lahore, Pakistan
- **Rabia Riaz** (2024). Optimization of CRISPR/Cas9-based Gene Knockout in Canola (*Brassica napus* L.) – targeting AtPQT3 Homologs for Paraquat Tolerance Trait. University of the Punjab, Lahore, Pakistan
- **Arshia Amin Khan** (2025). Evaluation of CRISPR/Cas9 mediated Soybean (*Glycine max* L.) mutants of AtPQT3 and AtPAR1 genes. University of the Punjab, Lahore, Pakistan
- **Sumbal Sabir** (2025). Tissue Culture Optimization and Genetic Transformation of Local Canola Varieties for Reporter and Herbicidal Genes. University of the Punjab, Lahore, Pakistan
- **Muhammad Huzefa Khan** (2026). Evaluation of Transgenic Progenies of Cotton Lines Expressing Five Genes (Cry1Ac, Cry2A, GTG, Vip3A, ASAL). University of the Punjab, Lahore, Pakistan
- **Huma Mushtaq** (2026). dsRNA-Mediated Silencing of Arginine Kinase and Juvenile Hormone Binding Protein in Pink Bollworm. University of the Punjab, Lahore, Pakistan
- **Javeria Rafiq** (2026). CRISPR/Cas-Mediated GmPQT3 Knockout and GTG Overexpression for Herbicide-Tolerant Soybean. University of the Punjab, Lahore, Pakistan
- **Ayesha Akram** (2026). Transformation of tobacco with CRISPR construct targeting potyviruses. Superior University, Lahore, Pakistan

MS Students (Continued)

- **Muhammad Zain Khan** (2027). Evaluation of efficacy of some dsRNAs against cotton bollworms. University of the Punjab, Lahore, Pakistan
- **Tehreem Irfan** (2027). Evaluation of transgenic progenies of cotton lines expressing five genes. University of the Punjab, Lahore, Pakistan
- **Ayesha Munir** (2024-26). Testing efficacy of soybean PQT3 mutant lines against different biotic stresses. University of the Punjab, Lahore, Pakistan

PhD Students Graduated (As Committee Member)

- **Hanif Tariq** (2023). Evaluation of dsRNAs targeting different genes in control of Colorado potato beetle (*Leptinotarsa decemlineata*). Nigde Omer Halisdemir University, Türkiye

- **Muhammad Nadir Naqqash (2019).** Use of Silencing Gene Techniques in Colorado potato beetle, *Leptinotarsa decemlineata*, control. Nigde Omer Halisdemir University, Türkiye
- **Muhammad Saleem (2019).** Pyramiding of Insecticidal Genes in Potato to encode Resistance against Colorado potato beetle, *Leptinotarsa decemlineata* (Say). Nigde Omer Halisdemir University, Türkiye
- **Tahira Hussain (2018)** Development of Potato Lines Resistant to Colorado Potato Beetle Using RNAi based Transformation Approach. Nigde Omer Halisdemir University. Nigde Omer Halisdemir University, Türkiye
- **Saber Delpasand Khabazi (2017)** Transformation of Cotton with *GNA* and *cryIac* gene for insect resistance. University of Ankara, Türkiye

MS Students Graduated (As Committee Member)

- **Beyazit Şanlı (2020).** Investigation of potential of miR162 in sustainable agriculture through overexpression in potato cultivars. Nigde Omer Halisdemir University, Türkiye
- **Melis Yalçın (2020).** Investigation of Function of Novel 9 miRNA in Contrasting Potato Cultivars Using Transgenic Approach. Nigde Omer Halisdemir University, Türkiye
- **Esra Karakaş (2019).** Identification of Tissue, developmental stage and Stress Response Specificity of WRKY Transcription Factor Family. Nigde Omer Halisdemir University, Türkiye
- **Busimuhan Abudureyimu (2019).** Analysis of the role of RNA metabolism regulator CPL1 in salinity stress tolerance in *Arabidopsis thaliana*. Nigde Omer Halisdemir University, Türkiye
- **Canan Sevinç (2019).** Isolation and cloning of phytochelatin synthase (pcs1) gene used for phytoremediation studies. Necmettin Erbakan University, Konya, Türkiye
- **Amir Maqbool (2018).** Investigation of Physiological, Biochemical and Molecular Response of Soybean Cultivars under Iron Deficiency. Nigde Omer Halisdemir University, Türkiye
- **Muhammad Hussain Azimi (2017).** Comparison of Drought Stress Response of Potato Varieties at the Transcriptomic Level. Nigde Omer Halisdemir University, Türkiye
- **Esra Kaplan (2017).** Identification of miRNAs in Response to Drought and Heat Stresses in Potato using Next generation Sequencing. Nigde Omer Halisdemir University, Türkiye
- **Beginmay Taalaybek kizi (2017).** Regulation of drought tolerance in Potato mediated by miRNAs. Nigde Omer Halisdemir University, Türkiye
- **Khazina Amin (2016).** Optimization of genetic transformation in Onion (*Allium Cepa* L.). Nigde Omer Halisdemir University, Türkiye
- **Hasibe Yildiz (2015).** Investigation of Tissue Culture Propagation Techniques of some Vaccinium Species. Nigde Omer Halisdemir University, Türkiye

BS Thesis Students (Graduated)

- **Nurefsan Cırık (2020)** Genetic Transformation studies in watermelon. Nigde Omer Halisdemir University, Türkiye
- **Esra Duru (2020).** Effect of drought and heat stress on in vitro cultured Black Nightshade. Nigde Omer Halisdemir University, Türkiye

- Ykbal Azezbayeva (2020). Optimization of in vitro culture conditions for cotton cultivars. Nigde Omer Halisdemir University, Türkiye
- Betül Ayça Dönmez (2019). Comparative Gene Transfer Efficiency of Five Agrobacterium Strains in Diploid and Tetraploid Potatoes
- İlknur Yel (2019). Optimization of Genetic Transformation in Diploid Potato
- Eyüp Özarslan (2019). PCR based detection of Begomoviruses from Different Weeds in Tarsus Surroundings
- Emre Benği (2019). Detection of Begomoviruses from Different Vegetables in Tarsus Surroundings
- Hilal İlkey Ataman (2018). Effect of dsRNA of EcR to CPB Fecundity and survival. Nigde Omer Halisdemir University.
- Zehranur Gülbahar (2018). Characterization of wound inducible promoter from *Asparagus Officinalis* L. Nigde Omer Halisdemir University.
- Oktay Şahin (2018). Investigation of Juberotox protein gene as potential insecticidal and antifungal agent. Nigde Omer Halisdemir University.
- Rabia Busenaz Kaya (2018). Over expression of DREB gene in Potato (*Solanum tuberosum* L.). Nigde Omer Halisdemir University, Türkiye

SCIENTIFIC JOURNAL EDITORSHIP

- PLOS ONE (SCI expanded)
- Turkish Journal of Agriculture and Forestry (SCI expanded)
- Frontiers in Genetics (SCI Expanded)
- Journal of Cotton Research (Emerging SCI)
- Frontiers in Plant Sciences (SCI Expanded)
- Turkish Journal of Agriculture, Food Science and Technology (Emerging SCI)
- Pure and Applied Biology
- Journal of Agriculture, Food, Environment and Animal Sciences

MEMBERSHIP OF LEARNED SOCIETIES

- The Society for *In vitro* Biology, USA (2018-19)
- International Society of Pest Information, Eulerweg 3, D-64347 Griesheim, Germany
- Member of Italo-Latin American Society of Ethnomedicine

CONFERENCE ORAL PRESENTATIONS

1. **Bakhsh A** (2026). Utilization of genome manipulation approaches to against biotic stresses for sustainable crop production. Presented as Invited Speaker in conference “Agricultural Sciences, Innovation and Research” held on 05-06th May in Kazakh National Agrarian Research University (KazNARU), Almaty, **Kazakhstan**.
2. **Bakhsh A** (2026). CRISPR-Cas9 mediated mutants of RNA Polymerase II (RNAPII) C-Terminal Domain Phosphatase like 3 gene in tomatoes show enhanced resistance against bacterial infection. Presented as Invited Speaker in International Conference on Life Sciences for Resilient Systems and Sustainable Futures (LS-RSF 2026) held from 21–23 April 2026 at Forman Christian College University, Lahore, **Pakistan**
3. **Bakhsh A** (2026). The dsRNA based green pesticides for the control of dusky cotton bug and pink bollworm, notorious pests of cotton. Presented as speaker in the 6th International Conference on Green Plant Protection Technology Innovation & China–Sri Lanka Agricultural Technology Collaboration, jointly organized by University of

Peradeniya, Sri Lanka and Guizhou University, China, held from 19th to 24th January 2026 in Colombo, **Sri Lanka**

4. **Bakhsh A** (2025). The dsRNA based green pesticides for the control of Colorado potato beetle, *Leptinotarsa Decemlineata* Say (chrysomelidae: Coleoptera). Presented in conference entitled “Advances in Integrated Pest and Pathogen Management” organized by Association of Applied Biologist (AAB) on November 11th-12th 2025 in Belmont Hotel, **Leicester, UK**
5. **Bakhsh A** (2025). Feeding the nation: GM corn studies in Pakistani context. Presented as **Invited Speaker** in conference entitled “GM and Non-GM Corn in Pakistan, Challenges and Opportunities” organized on 29th October 2025 by University of Agriculture, Faisalabad, **Pakistan**
6. **Bakhsh A** (2025) Scope of GMO/GE Scope in Pakistan. Presented in National Soybean Day Seminar in organized by Ayub Agriculture Research Institute, Faisalabad on September 25, 2025, Faisalabad, **Pakistan**
7. **Bakhsh A** (2025) Genome Editing in Crops, Opportunities and Challenges. Participated as expert in international dialogue on May 20 at National Institute for Genomics and Advance Biotechnology (NIGAB), National Agricultural Research Institute (NARC), Islamabad, **Pakistan**
8. **Bakhsh A** (2025). Genome Editing, Successes, Limitations and Regulatory Challenges. Presented as **Invited Speaker/Trainer** in training course on “Sustainable cotton production in OIC countries: strengthening farmer resilience and economic Growth” organized by Statistical, Economic and Social Research and Training Centre for Islamic Countries (**SESRIC**) on 11-12 March 2025, Ankara, **Türkiye**
9. **Bakhsh A** (2025). dsRNA-based green biopesticides against insect pests: towards better IPM. Presented as **Invited Speaker** to Refresher Course on Crop Improvement: From Breeding to Genome Editing March 3-7, 2025, Online Mode, Organized by Agri Biotech Foundation (ABF), Hyderabad and Federation of Asian Biotechnology Associations (FABA), Hyderabad, and ICAR-Indian Institute of Rice Research (IIRR), Hyderabad, **India**
10. **Bakhsh A** (2024). The regulatory landscape of genome edited plants with focus on regulatory policies: where we are heading. Presented as **Invited Plenary Speaker** in International Conference on Plant Biology and Biotechnology (**ICPBB 2024**), on June 03-06, 2024, Almaty, **Kazakhstan**.
11. **Bakhsh A**, Tariq H, Gökçe Ay (2024). The dsRNA based green pesticides for the control of Colorado potato beetle, *Leptinotarsa Decemlineata* Say (chrysomelidae: Coleoptera). **Presented as Invited Speaker in International Conference Astana Biotech 2024** on 12-13 September, Astana, **Kazakhstan**.
12. **Bakhsh A** (2024). Potential of dsRNA for better crop improvement. Presented in 1st International Congress on Biotech Solutions for Sustainability (Hybrid). Jointly Organized Institute of Biotechnology Gebze Technical University, Kocaeli Türkiye & Institute of Plant Breeding & Biotechnology, MNS University of Agriculture, Multan, **Pakistan**.
13. Tariq H, **Bakhsh A** (2024). dsRNA based green pesticides for the control of insect pests with case study of Colorado potato beetle. Presented as **Invited Speaker** in Conference on Plant Genomics for Climate Mitigation on 28th June, Forman Christian College University, Lahore, **Pakistan**.
14. **Bakhsh A** (2023). The advent of genome edited crops, towards better plant protection measures. Presented in International Scientific and Practical Conference "Phytosanitary Safety: threats and solutions" organized by Kazakh Research Institute of Plant Protection and Quarantine on 14-15 December 2023, Almaty, **Kazakhstan**.

15. **Bakhsh A** (2023). Modern day technologies to control insect pests of crops; Efficient IPM, better Farm Productivity. Presented in 1st International Turkic World Biology Congress organized by Ahmet Yassawi University on 23-24 November 2023, Turkestan, **Kazakhstan**.
16. **Bakhsh A** (2023). Modern genetically edited crops, implications, challenges and regulatory bottlenecks. Presented in 4th International Conference on Rehabilitation Sciences (ICRS) organized by Riphah International University on 6-8th October, Pearl Continental Hotel, Lahore, Pakistan
17. **Bakhsh A** (2023). The advent of genome edited cotton, new possibilities for cotton improvement in Pakistan. Presented at event organized by Pakistan Cotton Ginners Association on 7th October, Multan, Pakistan
18. **Bakhsh A**, Huma Z (2023). Modern Molecular Tools for Crop Improvement with case study of double stranded RNA based control of Dusky Cotton Bug. Presented in International Symposium on Turkic World, Science and Engineering Conference (Turk-COSE 2023) organized by Kyrgyz-Turkish Manas University on 14-16 September, Bishkek, **Kyrgyzstan**.
19. **Bakhsh A** (2023). Current Trends in Genome Editing of Crops; Success, Challenges and Regulatory Bottlenecks. Presented in Global conference on "Sustainable Developments in Agriculture, Biochemistry & Biotechnology organized by Women University, Multan on 15-16 February, Multan, Pakistan.
20. **Bakhsh A** (2023). Genome editing approach for better crop production and protection and regulatory landscape worldwide. Presented in International Conference on Mitigation and Adaptation (Focus on Agriculture and Food Security) organized by Forman Christian College University, on 6-9 February 2023, Lahore, Pakistan
21. **Bakhsh A** (2023). RNA interference; an important tool for better insect pest management. Presented in 2nd International Conference: New Trends in Biological Sciences organized by University of Okara on 16-17 January, Okara, Pakistan
22. Yasmin Aneela, **Bakhsh A**, Rao AQ (2022). Reduction in cold induced sweetening of potato through knockout of vacuolar invertase gene. Presented in VI. International Congress of Anatolian Agriculture, Food, Environment and Biology hosted by Nigde Omer Halisdemir University, Sivas Cumhuriyet University, Kutahya Dumlupinar University and Turkish Journal of Agriculture-Food Science and Technology (TURJAF), 07-09 October, Kütahya, **Türkiye**
23. **Bakhsh A** (2022). New Frontiers in Genome Editing of Plants and Regulatory Landscape Worldwide. Presented in Kazakhstan-Türkiye-Pakistan Youth Forum on Biotechnology organized by COMSTECH on 13-15th September, Islamabad, Pakistan.
24. **Bakhsh A**, Yasmin A, Rao AQ (2022). Addressing cold induced sweetening of potato through knock out of vacuolar invertase gene. Presented in 3rd PlantEd Conference on 5-7 September, Dusseldorf, **Germany**.
25. **Bakhsh A**, Yasmeen A, Rao AQ (2022). New Frontiers in Genome Editing of Crops, Success, challenges and regulatory bottlenecks. Presented in 3rd International Virtual Conference of Biotechnology Research Centre on 26-27 July 2022 organized by Al-Nahrain University, Baghdad, **Iraq (Keynote Speaker)**.
26. **Bakhsh A**, AQ Rao, Yasmeen A, Azam S, Latif A (2022). The knockout of vacuolar invertase gene in potato to address cold induced sweetening. Presented in 4th International Turkic World Conference on Science and Technology on 23-24 June organized by Nigde Omer Halisdemir University, Nigde, **Türkiye**.
27. **Bakhsh A** (2022). The fate of genome edited crops, a regulatory perspective. Presented in 3rd international colloquium: challenges and opportunities of maize production organized by University of Agriculture, Faisalabad, Pakistan on 18-20

May, 2022.

28. **Bakhsh A** (2022). Application of genome editing for better pest control and its regulatory landscape worldwide. Presented in International Conference on Food Security through Sustainable Plant Protection Strategies organized by Department of Plant Protection, The University of Agriculture, Peshawar, Pakistan on 16-20 January 2022.
29. **Bakhsh A** (2021). Case study: Development of genome-edited potato lines. Participated and presented as trainer in COMCEC-COMSTECH training and workshop on new breeding technologies for food and nutritional security on 30th Nov-2nd Dec, 2021, organized by Middle East Technical University, Ankara, **Türkiye**.
30. **Bakhsh A** (2021). Modern molecular tools for insect pest management of horticultural crops. Presented as live webinar organized by Institute of Horticultural Sciences, University of Agriculture, Faisalabad on 2nd December 2021.
31. **Bakhsh A** (2021). Utilization of new plant protection technologies in crop plants, way forward towards better IPM. Presented in 10th International Molecular Biology and Biotechnology Congress virtually held on 4-7th October 2021, organized by Ondokuz Mayıs University, Samsun, **Türkiye**.
32. **Bakhsh A** (2021). Use of genome engineering and manipulation technologies for better insect pest and disease control. Presented in 2nd International Congress of the Turkish Journal of Agriculture-Food Sciences and Technology, International congress organized by Turkish Science Technology Publishing (TURSTEP) 25-29th October, Gazimağusa, **Cyprus**.
33. **Bakhsh A** (2021). Genome editing in vegetable and fruit plants. Participated as speaker in a live webinar February 26th organized by Kazak National Agrarian University KazNAU, Almaty, **Kazakhstan**
34. **Bakhsh A** (2021). Modern day approaches to integrated pest management (2021). Participated as speaker in a live webinar (April 09th) organized by Muhammad Ali Jinnah University, Karachi, **Pakistan**
35. **Bakhsh A**, Aksoy E, Gökçe A (2020). Towards application of dsRNA Technology to downregulate imidacloprid resistant genes of Colorado potato beetle CPB). **Virtually conducted** on 12-13th June 2020, Ashgabad, **Turkmenistan**.
36. **Bakhsh A** (2020). Application of dsRNA Technology against insect pests; towards better IPM. Presented as **Keynote speaker** in 3rd International Conference on Applied Zoology (ICAZ-2020) **virtually conducted** on 07-08 December, Faisalabad, **Pakistan**.
37. **Bakhsh A** (2020). Efficient In planta and Sprayable Delivery of dsRNAs against Colorado potato beetle, *Leptinotarsa decemlineata* Say (Chrysomelidae: Coleoptera). Presented in 4th Annual Conference: Contribution of RNAi to sustainable agriculture, food safety and security in February 26-28, Athens, **Greece**
38. **Bakhsh A**, Naqqash MN, Aksoy E, Gökçe A (2020). Knock Down of Imidacloprid Resistant Genes in Colorado Potato Beetle, *Leptinotarsa decemlineata* (Chrysomelidae: Coleoptera). Presented in Plant and Animal Genome Conference XVIII, 11-15 January, San Diego, California, **USA**
39. **Bakhsh A**, Dangol S, Barakate A, Çalışkan ME (2019) Elucidation of the role of potato invertase inhibitor using Crispr-Cas9 application. Presented in The 1st PlantEd Conference, Plant Genome Editing-State of the Art Cost Action CA18111 (05-07 November) organized by University of Novi Sad, Novi Sad, **Serbia**
40. **Bakhsh A**, Aksoy E, Gökçe ZNO (2019). Modern day techniques for efficient insect pest management in crop plants. Presented at Eurasian Congress on Molecular Biotechnology (ECOMB) on 19-21 September 2019, Trabzon, **Türkiye**

41. Dangol S, Barakate A, Çalışkan ME and **Bakhsh A** (2019). Knockdown of Potato Invertase Inhibitor gene by CRISPR/Cas9 based approach. Presented in 2019 SIVB meeting (07-12 June) Tampa, Florida, **USA**
42. Rahamkulov I, Aksoy E, **Bakhsh A** (2019). Activity of stress inducible rd29A promoter in transgenic potato under abiotic stress. Presented in II International Green Biotechnology Congress (09-11 September) Organized by Marmara University, Istanbul, **Türkiye**
43. Naqqash MN, **Bakhsh A**, Gökçe A (2019). Silencing of some important genes leads to reduced fecundity and survival rates of Colorado Potato Beetle (*Leptinotarsa decemlineata* (Chrysomelidae: Coleoptera). Presented in 1st International Molecular Plant Protection Congress on 10-13 April, Adana, **Türkiye**
44. **Bakhsh A** (2019). Transgenic approaches towards better insect pest management. Presented in international seminar on modern techniques to improve crop yields in changing climate on 4th April 2019, Mansehra, **Pakistan**
45. Begimay TK, Asim A, **Bakhsh A**, Demirel U (2019). Investigating mirRNA Mediated Networking against Drought Tolerance in Potato (*Solanum tuberosum* L.). Presented in International Turkic World Congress on Science and Engineering on 17-18 June, Niğde Omer Halisdemir University, Niğde, **Türkiye**
46. Dangol SD, Çalışkan ME, **Bakhsh A** (2018). An insight into gene editing technologies and role of Crispr in plant improvement. Presented in CRISPR 2018 International Congress on 10-14 September, Novosibirsk, **Russia**
47. **Bakhsh A**, Hussain T, Aasim M, Pirlak U, Aksoy E, Caliskan ME (2018) Development of Transgenic Potato Lines Expressing Ecdysone Receptor Gene of Colorado Potato Beetle. Presented in 2018 SIVB meeting (02-06 June), St. Louis, Missouri, **USA**
48. **Bakhsh A**, Hussain T, Rahamkulov I, Aasim M, Pirlak U, Aksoy E, Caliskan ME (2018). Plant Mediated RNAi Strategy to Induce Insect Resistance in Transgenic Potato Lines. Presented as oral presentation at International Agricultural Science Congress (09-12 May), Van, **Türkiye**
49. **Bakhsh A**, Sumer S, Rahamkulov I, Hussain T, Demirel U, Caliskan ME (2018). Development of Glyphosate Tolerant Potato Lines Expressing Mutant Version of EPSP Synthase. Presented as oral presentation at 7th International Molecular Biology and Biotechnology Congress on 25-27 April, Konya, **Türkiye**
50. **Bakhsh A** (2018). Confinement of foreign gene expression to targeted parts of the plants. Presented as **invited speaker** in “Integration of classical and non-classical techniques to improve crop yields” on 19th September, Swabi, **Pakistan**
51. **Bakhsh A** (2018). Genetic manipulations in Soybean against biotic stresses. Presented in “International conference on biofortification of staple food crops on 24-26th September, The University of Agriculture-Peshawar, **Pakistan**
52. Dangol SD, Caliskan ME, **Bakhsh A** (2018). Various Gene Editing Strategies and Developments Based on CRISPR Technologies in Plants. Presented as oral presentation at International Agricultural Sciences Congress (09-12 May), Van, **Türkiye**
53. **Bakhsh A**, Anayol E, Ahmed HA et al. (2017). Confining Insecticidal Gene Expression to Insect Wounding Parts in Transgenic Cotton. Presented as invited speaker at SINO-PAK International conference on innovations in cotton breeding and biotechnology on 22-24 November, Multan, **Pakistan**
54. **Bakhsh A**, Hussain T, Demirel U, Çalışkan ME (2017). Towards developing herbicide resistant potato lines. Presented as **invited Speaker** in 6th International and 15th National Conference on “Dynamic Trends in Plant Sciences: Fostering

Environment (9-11 May), Quetta, **Pakistan**

55. Bakhsh A, Hussain T, Demirel U (2017). Developing herbicide resistant potato lines. Presented in International Plant & Animal Genome XXV / January 14-18, 2017 - San Diego – **USA**
56. **Bakhsh A**, Hussain T, Demirel U, Çalışkan ME. (2016). Development of Efficient, reproducible and stable genetic transformation protocol for potato cultivars. Presented in international conference on biological sciences (21-23 October), Konya, **Türkiye**
57. **Bakhsh A**, Dinç T (2016). Gene pyramiding strategy: an efficient approach to develop broad spectrum insect-resistant crops. Türkiye 6th Plant Protection Congress (5-8 September), Konya, **Türkiye**
58. **Bakhsh A**, Aasim M, Demirel U, Hussain T, Zia MAB, Çalışkan ME (2015). Gene pyramiding strategy to develop sustainable insect resistant tobacco lines. Presented in 1st International Congress on Applied and Biological Sciences (16-20 September), Tetova, **Macedonia**
59. Aasim A, **Bakhsh A**, Sadi G, Zia MAB, Karataş M, Khawar KM. 2015. Establishment of an efficient reproducible genetic transformation method in aquatic plant (*Bacopa monnieri* L.). Presented in 1st International Congress on Applied and Biological Sciences (16-20 September), Tetova, **Macedonia**
60. **Bakhsh A**, Zia MAB, Hussain T, Tekeli FÖ, Gökçe AF (2015). Members of Alliace; better source of plant lectins to combat against sucking pests of the crops. Presented in ISEA 2015; The 7th International Symposium on Edible Alliaceae (21-25th May), Niğde, **Türkiye**
61. **Bakhsh A**, Ozcan S (2015). Transgenic Bt crops with limited gene expression to insect biting sites only; an approach towards efficient pest resistance strategy. Presented in first conference on environment and biosciences (16-17th April) organized by Sardar Bahadir Khan Women's University, Quetta, **Pakistan**
62. **Bakhsh A**, Qayyum AQ, Shahid AA, Husnain T (2014). Insecticidal gene (cry1Ac) in transgenic Bt cotton under the control of tissue specific promoter (rbcS) exhibits enhanced resistance against lepidopterans. Presented in plant physiology and genetics; achievements and challenges (24-26 September) in Sofia, **Bulgaria**
63. **Bakhsh A** (2014). Current Status of GMOs, Economic Impact and Biosafety Assessments. Presented in 2nd KOP regional development symposium (23-24 October), Niğde, **Türkiye**
64. Özcan S, Anayol E, **Bakhsh A**, Onarıcı S, Aydın G, Aasim, Ozcan SF, Khawar KM, Ünlü L (2013). A new Approach to produce insect resistance transgenic cotton. Presented in Field Crop Congress, Konya, **Türkiye**
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