CURRICULUM VITAE

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QUALIFICATIONS

Exam.	Year	Marks/CGPA	% age	Div.	Subjects	Board/University
Matric	1993	677/850	79.65	1st	Science	Gujranwala Board
F. Sc.	1996	717/1100	65.18	1st	Pre-medical	Gujranwala Board
B. Sc.	1998	464/800	58.00	2nd	Botany, Zoology, Chemistry	University of the Punjab, Lahore
B. Ed.	2002	553/900	61.44	1st	Biology, Chemistry	Allama Iqbal Open University, Islamabad.
M. Sc.	2000	3.58/4.00	75.84	1st	Botany	University of Agriculture, Faisalabad.
M. Phil	2003	3.91/4.00	82.72	1st	Botany	University of Agriculture, Faisalabad.
Ph. D.	2007	-	-	1st	Botany	University of Agriculture, Faisalabad.
Post-doc	2010	-	-	-	Plant Physiology	Swammerdam Institute for Life Sciences, University of Amsterdam, The Netherlands

M. Sc. Thesis Title

- Influence of supplementary nitrogen on the growth and some physiological attributes of pearl millet (*Pennicetum glaucum* (Linn.) R. Br.) under water deficit conditions

M. Phil. Thesis Title

- Genetic variation in salinity (NaCl) tolerance in early semi-dwarf CIMMYT wheats

Ph. D. Under the Supervision of Dr. M. Ashraf, Department of Botany, University of Agriculture, Faisalabad.

Thesis Title

- Acclimation of wheat (*Triticum aestivum* L.) plants to salt stress by exogenous application of brassinosteroid

Post-doc Project under the Supervision of Dr. Teun Munnik, Swammerdam Institute for Life Sciences (SILS), University of Amsterdam, The Netherlands

Title:

- Role of phospholipase C in lateral root formation in *Arabidopsis thaliana*

Teaching and Research Experience

1. Lecturer (Per Lecture Basis), Department of Botany, University of Agriculture, Faisalabad-Pakistan (14.02.2003 to 24.10.2003)
2. Lecturer (Regular), Department of Botany, University of Agriculture, Faisalabad-Pakistan (25.10.2003 to 29.05.2007)
3. Assistant Professor (Adhoc), Department of Botany, University of Agriculture, Faisalabad-Pakistan (30.05.2007 to 10.08.2008)
4. Assistant Professor (Regular), Department of Botany, University of Agriculture, Faisalabad-Pakistan (11.08.2008 to 06.09.2023)
5. Associate Professor (Regular), Department of Botany, University of Agriculture, Faisalabad-Pakistan (07.09.2023 to date)

Administrative duties

1. Tutor for Tutorial Group-347 Bahadur Yar Jang-1 form 06.05.2011 to date
2. Member Preparation/calculation/rationalization of the budget of evening college and weekend programs of UAF and its sub-campus for Winter Semester 2020-21
3. Member for Scrutiny of Postgraduate admission applications from Faculty of Sciences, UAF for Admission Session 2021-22
4. Member synopsis scrutiny committee for the Department of Botany and Zoology, Wildlife and Fisheries, University of Agriculture, Faisalabad from 30-12-2021 to onward
5. Member "Central Scrutiny/Admission Committee for the Session, 2022-23 (13-05-2022) from Vice Chancellor office, UAF.

Research Grants/Projects:

Title	Donor Agency	Amount (Rs/$) In million	Duration	Role As PI/Co. PI

Completed				
1. Modulation of activities/levels of antioxidants, vitamins and osmoprotectants in some prospective summer and winter vegetables due to salt stress	Pakistan Academy of Sciences	2.00	June 2009 (Two years) 16.05.09 to **15.05.11**	Co-PI
2. Elucidation of antioxidative defense system and some potential physio-biochemical attributes in canola (*Brasssica napus* L.) under drought stress	Higher Education Commission	3.210249	September 2010 (Two years) 22.09.10 to **21.09.12**	Co-PI
3. Adaptive potential of newly developed commercial cultivars of wheat (*Triticum aestivum* L.) to multiple abiotic stresses	Higher Education Commission	3.79588	October 2010 (Three years) 06.10.10 to **31.10.13**	Co-PI
4. Appraisal of nutritional and antioxidative status of some important pulse crops grown under salinity and drought stresses	Pakistan Academy of Sciences	1.99134	April 14, 2012 (Two years) 14.04.2012 to **13.04.2014**	Co-PI
5. Identification of physiological and biochemical markers important for salt tolerance in rice (*Oryza sativa* L.) plants: the role of PI-PLC	Higher Education Commission	3.525132	August 09, 2011 (Two years) 09.08.2011 to 29.12.2013 (**20.03.2020**)	PI
6. Potential role of Strigolactone (GR24) in modulation of morpho-physiological, biochemical and yield attributes of sunflower (*Helianthus annuus* L.) under saline conditions	Higher Education Commission	1.655692	26.05.2015 (Two years) 26.05.2015 to 25.05.2017 (**05.10.2021**)	PI
Ongoing:				
1. Endogenous salicylic acid biosynthesis and its possible relationship with abiotic stress tolerance in wheat	Higher Education Commission	1.44622	December 8, 2010 (Two years) 08.12.2010 to 07.12.2012	Co-PI

Awards and Honors:

1. Post-doc fellowship from Higher Education Commission, Islamabad-Pakistan in 2009.
2. Research Productivity Award 2010 (Category G) by Pakistan Council for Science and Technology
3. Research Productivity Award 2011 (Category F) by Pakistan Council for Science and Technology

4. Research Productivity Award 2012 (Category E) by Pakistan Council for Science and Technology
5. Research Productivity Award 2013 (Category C) by Pakistan Council for Science and Technology
6. Research Productivity Award 2014 (Category D) by Pakistan Council for Science and Technology
7. Research Productivity Award 2015 (Category D) by Pakistan Council for Science and Technology
8.

Membership of Scientific Societies:

1. Pakistan Botanical Society (Life member)
2.

Reviewer of National and International Journals:

1. Acta Agriculturae Scandanvica Section B-Plant Soil Science
2. Acta Physiologiae Plantarum (Poland)
3. Biologia Plantarum
4. Environmental and Experimental Botany (The Netherlands)
5. EurAsian Journal of BioSciences
6. International Journal of Plant and Soil Science
7. International Research Journal of Plant Science
8. Journal of Crop Improvement
9. Journal of Microbiology and Antimicrobials
10. Journal of Plant Breeding and Crop Science
11. Pakistan Journal of Botany (Pakistan)
12. Scientia Horticultrae
13. Soil and Environment (Pakistan)
14. South African Journal of Botany
15. Turkish Journal of Botany

PUBLICATIONS
BOOKS

1. Wahid, A. and **M. Shahbaz. 2017.** A Textbook on Thallose Autotrophs. ISBN 978-969-7705-01-6. Managing Editors: Khan, I. A. and F. Ahmad. Publisher: University of Agriculture, Faisalabad-Pakistan, pp. 1-203.

BOOK CHAPTERS

1. Saddique, M., M. Kamran and **M. Shahbaz. 2018.** Differential Responses of Plants to Biotic Stress and the Role of Metabolites. In: Parvaiz Ahmad, Mohammad Abass Ahanger, Vijay Pratap Singh, Durgesh Kumar Tripathi, Pravej Alam and Mohammed Nasser Alyemeni; Plant Metabolites and Regulation Under Environmental Stress, ISBN: 978-0-12-812689-9, Publisher: Andre G. Wolff, Academic Press, Elsevier, pp. 69-87.
2. Saddique, M. and **M. Shahbaz. 2019.** Enhancing the drought tolerance in eggplant by exogenous application of osmolytes in water-deficit environment. In: Munir Ozturk, Khalid Rehman Hakeem, Muhammad Ashraf and Muhammad Sajid Aqeel Ahmad: Crop Production Technologies for Sustainable Use and Conservation, ISBN: 973-0-429-46976-3, Publisher: Apple Academic Press Inc. USA, pp. 283-302.
3. Naqve, M. and **M. Shahbaz. 2019.** Enhancing morpho-physiological responses and yield potential in okra (*Abelmoschus esculentus* L. Moench) under salinity stress. In: Munir Ozturk, Khalid Rehman Hakeem, Muhammad Ashraf and Muhammad Sajid Aqeel Ahmad: Crop Production Technologies for Sustainable Use and Conservation, ISBN: 973-0-429-46976-3, Publisher: Apple Academic Press Inc. USA, pp. 303-320.
4. Ahmad, A., S. Ashraf, N. Munawar, A. Jamil, A. Ghaffar and **M. Shahbaz. 2021.** CRISPR/Cas-Mediated Abiotic Stress Tolerance in Crops. In: Ahmad, A., Khan, S.H., Khan, Z. (eds) CRISPR Crops. Springer, Singapore. https://doi.org/10.1007/978-981-15-7142-8_6

PUBLICATIONS

1. Ashraf, M., **M. Shahbaz** and M. Y. Ashraf. **2001.** Influence of nitrogen supply and water stress on growth and nitrogen, phosphorus, potassium and calcium contents in pearl millet. ***Biologia Plantarum.*** **44(3): 459-462**.
2. Ashraf, M., **M. Shahbaz**, S. Mahmood and E. Rasul. **2001.** Relationships between growth and photosynthetic characteristics in pearl millet (*Pennicetum glaucum*) under limited water deficit conditions with enhanced nitrogen supplies. ***Belgian Journal of Botany.*** **134(2): 131-144**.
3. Ashraf, M., M. Arfan, **M. Shahbaz**, Ashfaq Ahmad and A. Jamil. **2002.** Gas exchange characteristics and water relations in some elite okra cultivars under water deficit. ***Photosynthetica.*** **40(4): 615-620**.
4. Ashraf, M. and **M. Shahbaz**. **2003.** Assessment of genotypic variation in salt tolerance of early CIMMYT hexaploid wheat germplasm using photosynthetic capacity and water relations as selection criteria. ***Photosynthetica*****. 41(2): 273-280.**
5. Ashraf, M., **M. Shahbaz** and T. McNeilly. **2005.** Phylogenetic relationship of salt tolerance in early Green Revolution CIMMYT wheats. ***Environmental and Experimental Botany***. **53: 173-184.**

6. Maqsood, A., **M. Shahbaz** and N. A. Akram. **2006.** Influence of exogenously applied glycinebetaine on growth and gas exchange characteristics of maize (*Zea mays* L.). ***Pakistan Journal of Agricultural Sciences***. **43(1-2): 36-41.**
7. Akram, N. A., **M. Shahbaz,** H. R. Athar and M. Ashraf. **2006**. Morpho-physiological responses of two differently adapted populations of *Cynodon dactylon* (L.) Pers. and *Cenchrus ciliaris* L. to salt stress. ***Pakistan Journal of Botany,* 38(5): 1581-1588.**
8. **Shahbaz, M.** and M. Ashraf. **2007.** Influence of exogenous application of brassinosteroid on growth and mineral nutrients of wheat (*Triticum aestivum* L.) under saline conditions. ***Pakistan Journal of Botany.* 39 (2): 513-522.**
9. Qayyum, B., **M. Shahbaz** and N. A. Akram. **2007.** Interactive effect of foliar application of 24-epibrassinolide and root zone salinity on morpho-physiological attributes of wheat (*Triticum aestivum* L.). ***International Journal of Agriculture and Biology*, 9(4): 584-589.**
10. Akram, N. A., **M. Shahbaz** and M. Ashraf. **2007.** Relationship of photosynthetic capacity and proline accumulation with the growth of differently adapted populations of two potential grasses (*Cynodon dactylon* (L.) Pers. and *Cenchrus ciliaris* L.) to drought stress. ***Pakistan Journal of Botany*, 39 (3): 777-786.**
11. Naheed, G., **M. Shahbaz,** A. Latif and E. S. Rha. **2007**. Alleviation of the adverse effects of salt stress on rice (*Oryza sativa* L.) by phosphorus applied through rooting medium: growth and gas exchange characteristics. ***Pakistan Journal of Botany*, 39(3): 729-737.**
12. Akhter, N., N. A. Akram and **M. Shahbaz. 2007.** Presowing seed treatments with glycinebetaine and mineral nutrients of wheat (*Triticum aestivum* L.) under saline conditions. ***Pakistan Journal of Agricultural Sciences.* 44(2): 236-241.**
13. Jabeen, S., **M. Shahbaz** and N. A. Akram. **2007.** Influence of exogenous application of salicylic acid on growth and gas exchange characteristics of wheat (*Triticum aestivum* L.) under control or saline conditions. ***Life Sciences International Journal. 1(4): 425-431.***
14. **Shahbaz, M.,** M. Ashraf and H. R. Athar. **2008.** Does exogenous application of 24-epibrassinolide ameliorate salt induced growth inhibition in wheat (*Triticum aestivum* L.)? ***Plant Growth Regulation, 55(1): 51-64.***
15. Ali, Q., M. Ashraf, **M. Shahbaz** and H. Humera. **2008.** Ameliorating effect of foliar applied proline on nutrient uptake in water stressed maize (*Zea mays* L.) plants. ***Pakistan Journal of Botany, 40(1): 211-219.***
16. Naheed, G., **M. Shahbaz**, N. A. Akram and M. Ashraf. **2008.** Interactive effect of rooting medium application of phosphorus and NaCl on plant biomass and mineral nutrients of rice (*Oryza sativa* L.). ***Pakistan Journal of Botany, 40(3):1601-1608.***
17. Akram, N. A., **M. Shahbaz** and M. Ashraf. **2008.** Nutrient acquisition in differentially adapted populations of *Cynodon dactylon* (L.) Pers. and *Cenchrus ciliaris* L. under drought stress. ***Pakistan Journal of Botany, 40(4):1433-1440.***
18. Jabeen, F., **M. Shahbaz** and M. Ashraf. **2008.** Discriminating some prospective cultivars of maize (*Zea mays* L.) for drought tolerance using gas exchange characteristics and proline contents as physiological markers. ***Pakistan Journal of Botany*, 40(6): 2329-2343.**
19. Kamran, M, **M. Shahbaz,** M. Ashraf and N. A. Akram. **2009.** Alleviation of drought-induced adverse effects in spring wheat (Triticum aestivum L.) using proline as pre-sowing seed treatment. ***Pakistan Journal of Botany*, 41(2): 621-632.**
20. Mahmood, T., M. Ashraf and **M. Shahbaz. 2009.** Does exogenous application of glycinebetaine as a pre-sowing seed treatment improve growth and regulate some key

physiological attributes in wheat plants grown under water deficit conditions? **Pakistan Journal of Botany 41(3): 1291-1302 (Pakistan).**

21. Malik, S., M. Ashraf, **M. Shahbaz** and T.A. Malik. **2009.** Modulation in growth, some physiological attributes and fibre quality in upland cotton (*Gossypium hirsutum* L.) due to frego bract mutation. **Pakistan Journal of Botany 41(5): 2157-2166**
22. Akram, M. S., M. Ashraf, **M. Shahbaz** and N. A. Akram. 2009. Growth and photosynthesis of salt-stressed sunflower (*Helianthus annuus*) plants as affected by foliar-applied different potassium salts. ***Journal of Plant Nutrition and Soil Science,* 172: 884-893.**
23. Perveen, S., **M. Shahbaz** and M. Ashraf. 2010. Regulation in gas exchange and quantum yield of photosystem II (PSII) in salt-stressed and non-stressed wheat plants raised from seed treated with triacontanol. ***Pakistan Journal of Botany*, 42(5): 3073-3081.**
24. **Shahbaz, M.,** M. Ashraf, N. A. Akram, A. Hanif, S. Hameed, S. Joham and R. Rehman. 2011. Salt-induced modulation in growth, photosynthetic capacity, proline content and ion accumulation in sunflower (*Helianthus annuus* L.). ***Acta Physiologiae Plantarum,* 33: 1113-1122.**
25. **Shahbaz, M.** and B. Zia. 2011. Does exogenous application of glycinebetaine through rooting medium alter rice (*Oryza sativa* L.) mineral nutrient status under saline conditions? ***Journal of Applied Botany Food Quality,* 84(1): 54-60.**
26. **Shahbaz, M.,** M. Iqbal and Muhammad Ashraf. 2011. Response of differently adapted populations of blue panic grass (*Panicum antidotale* Retz.) to water deficit conditions. ***Journal of Applied Botany Food Quality,* 84(2): 134-141.**
27. Perveen, S., **M. Shahbaz** and M. Ashraf. 2011. Modulation in activities of antioxidant enzymes in salt stressed and non-stressed wheat (*Triticum aestivum* L.) plants raised from seed treated with triacontanol. ***Pakistan Journal of Botany*, 43(5): 2463-2468.**
28. Kanwal, H., M. Ashraf and **M. Shahbaz.** 2011. Assessment of salt tolerance of some newly developed and candidate wheat (*Triticum aestivum* L.) cultivars using gas exchange and chlorophyll fluorescence attributes. ***Pakistan Journal of Botany*, 43(6): 2693-2699.**
29. **Shahbaz, M.,** Y. Masood, S. Perveen and M. Ashraf. 2011. Is foliar-applied glycinebetaine effective in mitigating the adverse effects of drought stress on wheat (*Triticum aestivum* L.)? ***Journal of Applied Botany Food Quality,* 84(2): 192-199.**
30. Perveen, S., **M. Shahbaz** and M. Ashraf. 2012. Changes in mineral composition, uptake and use efficiency of salt stressed wheat (*Triticum aestivum* L.) plants raised from seed treated with triacontanol. ***Pakistan Journal of Botany*, 44: 27-35.**
31. Ashraf, M. A., M. Ashraf and **M. Shahbaz.** 2012. Growth stage-based modulation in antioxidant defense system and proline accumulation in two hexaploid wheat (*Triticum aestivum* L.) cultivars differing in salinity tolerance. ***Flora,* 207(5): 388-397.**
32. **Shahbaz, M.,** M. Ashraf, F. Al-Qurainy, and P.J.C. Harris. 2012. Salt tolerance in selected vegetable crops. ***Critical Reviews in Plant Sciences,* 31(4): 303-320.**
33. Perveen, S., **M. Shahbaz** and M. Ashraf. 2012. Is pre-sowing seed treatment with triacontanol effective in improving some physiological and biochemical attributes of wheat (*Triticum aestivum* L.) under salt stress? ***Journal of Applied Botany and Food Quality*, 85: 41-48.**
34. Shaheen, H.L. and **M. Shahbaz.** 2012. Salt-induced effects on some key morpho-physiological attributes of cotton (*Gossypium hirsutum* L.) at various growth stages. ***Soil and Environment*, 31(2): 125-133.**
35. Shaheen, H.L., **M. Shahbaz**, I. Ullah and M.Z. Iqbal**.** 2012. Morpho-physiological

responses of cotton (*Gossypium hirsutum* L.) to salt stress. ***International Journal of Agriculture and Biology,* 14: 980-984.**

36. **Shahbaz, M.,** N. Noreen and S. Perveen. 2013. Triacontanol modulates photosynthesis and osmoprotectants in canola (*Brassica napus* L.) under saline stress. ***Journal of Plant Interactions,* 8(4): 250-259.**
37. Kausar, F. and **M. Shahbaz.** 2013. Interactive effect of foliar application of nitric oxide (NO) and salinity on wheat (*Triticum aestivum* L.). ***Pakistan Journal of Botany* 45(SI): 67-73.**
38. **Shahbaz, M.** and M. Ashraf. 2013. Improving salinity tolerance in cereals. ***Critical Reviews in Plant Sciences,* 32: 237-249.**
39. Ashraf, M., **M. Shahbaz** and Q. Ali. 2013. Drought-induced modulation in growth and mineral nutrients of canola (*Brassica napus* L.). ***Pakistan Journal of Botany,* 45(1): 93-98.**
40. Hussain, M. I., H. N. Asghar, M. Arshad and **M. Shahbaz.** 2013. Screening of multi-trait rhizobacteria to improve maize growth under axenic conditions. ***The Journal of Animal and Plant Sciences,* 23(2): 514-520.**
41. Kanwal, S., M. Ashraf, **M. Shahbaz** and M. Y. Iqbal. 2013. Influence of saline stress on growth, gas exchange, mineral nutrients and non-enzymatic antioxidants in mungbean [(*Vigna radiata* (L.) Wilczek]. ***Pakistan Journal of Botany,* 45(3): 763-771.**
42. Habib, N., M. Ashraf and **M. Shahbaz.** 2013. Effect of exogenously applied nitric oxide on some key physiological attributes of rice (*Oryza sativa* L.) plants under salt stress. ***Pakistan Journal of Botany,* 45(5): 1563-1569.**
43. Kausar, F., **M. Shahbaz** and M. Ashraf. 2013. Protective role of foliar-applied nitric oxide in wheat (*Triticum aestivum* L.) under saline stress. ***Turkish Journal of Botany,* 37: 1155-1165.**
44. Perveen, S.**, M. Shahbaz** and M. Ashraf. 2013. Influence of foliar-applied triacontanol on growth, gas exchange characteristics, photosynthetic pigments and chlorophyll flourescence at different growth stages in wheat *(Triticum aestivum* L.) under saline conditions. ***Photosynthetica,* 51(4): 541-551.**
45. **Shahbaz, M.,** Z. Mushtaq, F. Andaz and A. Masood. 2013. Does proline application ameliorate adverse effects of salt stress on growth, ions and photosynthetic ability of eggplant (*Solanum melongena* L.)? ***Scientia Horticulturae,* 164: 507-511.**
46. Aziz, R., **M. Shahbaz** and M. Ashraf. 2013. Influence of foliar application of triacontanol on growth attributes, gas exchange and chlorophyll fluorescence in sunflower (*Helianthus annuus* L.) under saline stress. ***Pakistan Journal of Botany,* 45(6): 1913-1918.**
47. Zulfiqar, S. and **M. Shahbaz.** 2013**.** Modulation of gas exchange parameters and photosystem-II activity of canola (*Brassica napus* L.) by foliar-applied triacontanol under salt stress. ***Agrochimica,* 57(3): 193-200.**
48. Perveen, S., **M. Shahbaz** and M. Ashraf. 2014. Triacontanol-induced changes in growth, yield, leaf water relations, antioxidative defense system and some key osmoprotectants in bread wheat (*Triticum aestivum* L.) under saline stress. ***Turkish Journal of Botany,* 38: 896-913.**
49. Afzal, A., I. Gulzar, **M. Shahbaz** and M. Ashraf. 2014. Water deficit-induced regulation of growth, gas exchange, chlorophyll fluorescence, inorganic nutrient accumulation and antioxidative defense mechanism in mungbean [*Vigna radiata* (L.) Wilczek]. ***Journal of Applied Botany and Food Quality,* 87: 147-156.**

50. Nusrat, N., **M. Shahbaz** and S. Perveen. 2014. Modulation in growth, photosynthetic efficiency, activity of antioxidants and mineral ions by foliar application of glycinebetaine on pea (*Pisum sativum* L.) under salt stress. ***Acta Physiologiae Plantarum*, 36: 2985-2998.**
51. Shabbir, R. N., M. Y. Ashraf, E.A. Waraich, R. Ahmad and **M. Shahbaz.** 2015. Combined effects of drought stress and NPK foliar spray on growth, physiological processes and nutrient uptake in wheat. ***Pakistan Journal of Botany*, 47(4): 1207-1216.**
52. Aziz, R. and **M. Shahbaz.** 2015. Triacontanol-induced regulation in the key osmoprotectants and oxidative defense system of sunflower plants at various growth stages under salt stress. ***International Journal of Agriculture and Biology*, 17: 881-890.**
53. Waraich, E. A., Z. Ahmed, R. Ahmad and **M. Shahbaz**. 2015. Physiological and biochemical attributes of *Camelina sativa* (L.) Crantz under water stress conditions. **Proceedings of the 17th ASA Conference, 20 – 24 September 2015, Hobart, Australia.**
54. Rafique, H. M., H. N. Asghar, Z. A. Zahir and **M. Shahbaz.** 2015. Evaluation of plant growth promoting bacteria for inducing stress tolerance in plants against petroleum hydrocarbons. ***Pakistan Journal of Agricultural Sciences*, 52(4): 905-914.**
55. Haider, M. M., A. Ahmad, T. Khaliq and **M. Shahbaz.** 2015. Simulating the effects of sowing on growth and yield of wheat in arid environment using APSIM-model. ***Applied Sciences and Business Economics*, 2(2): 01-07**.
56. Perveen, S., R. Farooq and **M. Shahbaz.** 2016. Thiourea-induced metabolic changes in two mung bean [*Vigna radiata* (L.) Wilczek] (Fabaceae) varieties under salt stress. ***Brazilian Journal of Botany*, 39(1): 41-54.**
57. Shaheen, H. L., M. Iqbal, M. Azeem, **M. Shahbaz** and M. Shehzadi. 2016. K-priming positively modulates growth and nutrient status of salt-stressed cotton (*Gossypium hirsutum*) seedlings. ***Archives of Agronomy and Soil Science*, 62: 759–768.**
58. Masood, A. and **M. Shahbaz.** 2016. Morpho-physiological modulations in rice (*Oryza sativa*) by foliar application of phospholipase-C inhibitor neomycine under saline conditions. ***International Journal of Agriculture and Biology*, 18: 710-718.**
59. Perveen, S., **M. Shahbaz,** M. Iqbal, M. S. Akram, A. Parveen and H. M. M. Ali. 2016. Induction of cadmium stress tolerance in *Triticum aestivum* L. by alfalfa leaf extract. ***Applied Ecology and Environmental Research 14(5):121-136.***
60. Perveen, S., M. Iqbal, A. Parveen, M. S. Akram, **M. Shahbaz**, S. Akber and A. Mehboob. 2017. Exogenous triacontanol-mediated increase in phenolics, proline, activity of nitrate reductase and shoot k^+ confers salt tolerance in maize (*Zea mays* L.). ***Brazilian Journal of Botany*, 40(1): 1-11. DOI:10.1007/s40415-016-0310-y.**
61. Ahmed, Z., E. A. Waraich, R. Ahmad and **M. Shahbaz. 2017.** Morpho-physiological and biochemical responses of Camelina (*Camelina sativa crantz* L.) genotypes under drought stress. ***International Journal of Agriculture and Biology, 19: 1-7*.**
62. **Shahbaz, M.**, A. Abid, A. Masood and E. A. Waraich. 2017. Foliar-applied trehalose modulates growth, mineral nutrition, photosynthetic ability, and oxidative defense system of rice (*Oryza sativa* L.) under saline stress. ***Journal of Plant Nutrition 40(4): 584-599.***
63. Kausar, F. and **M. Shahbaz, 2017.** Influence of strigolactone (GR24) as a seed treatment on growth, gas exchange and chlorophyll fluorescence of wheat under saline conditions. ***International Journal of Agriculture and Biology*, 19: 321–327.**
64. Ahmad, Z., E. A. Waraich, R. Ahmad and **M. Shahbaz. 2017.** Modulation in water relations, chlorophyll contents and antioxidants activity of maize by foliar phosphorus application under drought stress. ***Pakistan Journal of Botany, 49(1): 11-19***.

65. Waraich, E. A., Z. Ahmed, R. Ahmad, Saifullah, **M. Shahbaz** and Ehsanullaha. 2017. Modulation in growth, development, and yield of *Camelina sativa* by nitrogen application under water stress conditions. ***Journal of Plant Nutrition, 40(5): 726-735.***
66. Rashid, N., S. M. A. Basra, **M. Shahbaz**, S. Iqbal and M. B. Hafeez. 2018. Foliar applied moringa leaf extract induces terminal heat tolerance in quinoa. ***International Journal of Agriculture and Biology,* 20: 157-164.**
67. Lalarukh, I. and **M. Shahbaz.** 2018. Alpha-tocopherol induced modulations in morpho-physiological attributes of sunflower (*Helianthus annuus*) when grown under saline environment. ***International Journal of Agriculture and Biology,* 20: 661-668.**
68. Zhang, Q., R. V. Wijk, **M. Shahbaz**, W. Roels, B. V. Schooten, J. E. M. Vermeer, X. Zarza, A. Guardia, D. Scuffi, C. García-Mata, D. Laha, P. Williams, L. A. J. Willems, W. Ligterink, S. Hoffmann-Benning, G. Gillaspy, G. Schaaf, M. A. Haring, A. M. Laxalt and T. Munnik. 2018. Arabidopsis phospholipase C3 is involved in lateral root initiation and ABA responses in seed germination and stomatal closure. ***Plant and Cell Physiology, 59(3): 469-486. doi: 10.1093/pcp/pcx194.***
69. Naheed, R., M. Arfan, S. Ijaz and **M. Shahbaz.** 2018. Induction of somaclonal variation in selected drought sensitive genotype of sugarcane (*Sachharum officinarum*). ***International Journal of Agriculture and Biology,* 20: 777-783.**
70. Qirat, M., **M. Shahbaz** and S. Perveen. 2018. Beneficial role of foliar-applied proline on carrot (*Daucus carota* L.) under saline conditions. ***Pakistan Journal of Botany, 50(5): 1735-1744***.
71. Zhang, Q., R. V. Wijk, X. Zarza, M. Shahbaz, M. V. Hooren, A. Guardia, D. Scuffi, C. Garcıa-Mata, W. V. den Ende, S. Hoffmann-Benning, M. A. Haring, A. M. Laxalt and T. Munnik. 2018. Knock-down of Arabidopsis PLC5 reduces primary root growth and secondary root formation while overexpression improves drought tolerance and causes stunted root hair growth. ***Plant and Cell Physiology, 59(10): 2004-2019. doi: 10.1093/pcp/pcy120.***
72. Naqve, M., **M. Shahbaz,** A. Wahid and E. A. Waraich. 2018. Seed priming with alpha tocopherol improves morpho-physiological attributes of okra under saline conditions. ***International Journal of Agriculture and Biology,*** 20: 2647–2654
73. Sarwar, Y. and **M. Shahbaz. 2019.** GR24 triggered variations in morpho-physiological attributes of sunflower (*Helianthus annuus* L.) under salinity. ***International Journal of Agriculture and Biology,* 21: 34–40.**
74. Saddique, M. and **M. Shahbaz. 2019**. Mitigation of drought stress-induced adverse effects on antioxidant system of eggplant by exogenous application of alpha-tocopherol. ***International Journal of Agriculture and Biology*, 21: 971−978.**
75. Hadayat, N., M. Hussain, **M. Shahbaz** and R. Ahmad. **2019.** Physio-biochemical responses of apple-of-sodom [*Calotropis procera* (Aiton) W. T. Aiton] to vehicular pollution. ***Pakistan Journal of Botany, 51(2): 609-616.***
76. Batool, S., A. Wahid, S. M. A. Basra and **M. Shahbaz. 2020.** Light augments the action of foliar applied plant growth regulators: Evidence using etiolated maize (*Zea mays*) seedlings. ***International Journal of Agriculture and Biology*, 23:801–810**
77. Sarwar, Y. and **M. Shahbaz. 2020.** Modulation in growth, photosynthetic pigments, gas exchange attributes and inorganic ions in sunflower (*Helianthus annuus* L.) by strigolactones (GR24) achene priming under saline conditions. ***Pakistan Journal of Botany, 52(1): 23-31.***

78. Lalarukh, I. and **M. Shahbaz. 2020.** Response of antioxidants and lipid peroxidation to exogenous application of alpha-tocopherol in sunflower (*Helianthus annuus* L.) under salt stress. ***Pakistan Journal of Botany, 52(1): 75-83.***
79. Tariq, A. and **M. Shahbaz. 2020.** Glycinebetaine induced modulation in oxidative defense system and mineral nutrients Sesame (*Sesamum indicum* L.) under saline regimes. ***Pakistan Journal of Botany, 52(3): 775-782.***
80. Gul, F., M. Arfan, **M. Shahbaz** and S. M. A. Basra. **2020**. Salicylic acid seed priming modulates morphology, nutrient relations and photosynthetic attributes of wheat grown under cadmium stress. ***International Journal of Agriculture and Biology,* 23:197–204.**
81. Ramzan, A., M. Arfan, **M. Shahbaz** and S. M. A. Basra. **2020**. Hyperaccumulation response of quinoa to soil-applied cadmium: Abetter choice as cadmium phytoremediating plant. ***International Journal of Agriculture and Biology,* 24:603–609.**
82. Nawaz, A., **M. Shahbaz**, Asadullah, A. Imran, M. U. Marghoob, M. Imtiaz and F. Mubeen. **2020**. Potential of salt tolerant PGPR in growth and yield augmentation of wheat (*Triticum aestivum* L.) under saline conditions. ***Frontiers in Microbiology, 11:2019. doi: 10.3389/fmicb.2020.02019.***
83. Parveen, N., A. Masood, M. T. Mahmood, N. Khalid and M. Shahbaz. 2020. Screening of chickpea germplasm for growth and yield related traits under agro-climatic conditions of Thal. ***Genetics and Molecular Research, 19 (5):gmr16039990***
84. Lalarukh, I. and M. Shahbaz. 2020. Impact of alpha-tocopherol seed priming on accumulation of osmolytes and ion homeostasis in sunflower (*Helianthus annuus*) under salt stress. ***International Journal of Agriculture and Biology, 24:1672–1680.***
85. Zulfiqar, H., **M. Shahbaz,** M. Ahsan, M. Nafees, H. Nadeem, M. Akram, A. Maqsood, S. Ahmar, M. Kamran, S. Alamri, M. H. Siddiqui, S. Saud and S. Fahad. **2021**. Strigolactone (GR24) induced salinity tolerance in sunflower (*Helianthus annuus* L.) by ameliorating morpho-physiological and biochemical attributes under in vitro conditions. ***Journal of Plant Growth Regulation, 40: 2079-2091 https://doi.org/10.1007/s00344-020-10256-4.***
86. Maqsood, M. F., **M. Shahbaz**, M. Arfan and S. M. A. Basra. **2021**. Presowing seed treatment with glycine betaine confers NaCl tolerance in quinoa by modulating some physiological processes and antioxidant machinery. ***Turkish Journal of Botany, 45: 1-14.***
87. Aslam, S., M. Hameed and **M. Shahbaz. 2021**. Distribution and ecology of some *Carex* L. Species in sub-tropical pine and Himalayan moist temperate forests. ***Pakistan Journal of Botany, 52(3): 1821-1829.***
88. Amjad, S. F., N. Mansoora, S. Yaseen, A. Kamal, B. Butt, H. Matloob, S. A. M. Alamri, S. A. Alrumman, E. M. Eid and **M. Shahbaz. 2021**. Combined use of endophytic bacteria and pre-sowing treatment of thiamine mitigates the adverse effects of drought stress in wheat (*Triticum aestivum* L.) cultivars. ***Sustainability 13: 6582. https://doi.org/10.3390/su13126582.***
89. Naqve, M., X. Wang, **M. Shahbaz,** S. Fiaz, W. Naqvi, M. Naseer, A. Mahmood and H. Ali. **2021.** Foliar spray of alpha-tocopherol modulates antioxidant potential of okra fruit under salt stress. ***Plants, 10: 1382. https://doi.org/10.3390/plants10071382.***
90. Bukhari, S. A. B. H., I. Lalarukh, S. F. Amjad, N. Mansoora, M. Naz, M. Naeem, S. A. Bukhari, **M. Shahbaz**, S. A. Ali, T. D. Marfo, S. Danish, R. Datta and S. Fahad. **2021**. Drought stress alleviation by potassium-nitrate-containing chitosan/montmorillonite microparticles confers changes in *Spinacia oleracea* L. ***Sustainability, 13: 9903. https://doi.org/10.3390/su13179903.***

91. Naqve M, X. Wang, **M. Shahbaz**, A. Mahmood, S. Bibi and S. Fiaz. **2021**. Alpha tocopherol-induced modulations in the morphophysiological attributes of okra under saline conditions. ***Frontiers in Plant Science, 12:800251. doi: 10.3389/fpls.2021.800251.***
92. Tariq, A., **M. Shahbaz** and F. Farhat. **2021**. Seed priming with glycinebetaine improves germination, yield, gas exchange and photosynthetic attributes in *Sesamum indicum* under saline stress. ***Pakistan Journal Agricultural Sciences, 58(6): 1887-1894.***
93. Naqve, M., **M. Shahbaz,** M. Naseer and A. Mahmood. **2021**. Alpha tocopherol application as seed priming alters antioxidative defense system of okra against salinity stress. ***Polish Journal of Environmental Studies, 30(5): 4143-4152.***
94. Siddique, S., M. Naveed, M. Yaseen and **M. Shahbaz. 2022.** Exploring potential of seed endophytic bacteria for enhancing drought stress resilience in maize (*Zea mays* L.). ***Sustainability, 14: 673. https://doi.org/10.3390/su14020673.***
95. Perveen, S., M. Parvaiz, **M. Shahbaz,** M. Saeed and S. Zafar. **2022.** Triacontanol positively influences growth, yield, biochemical attributes and antioxidant enzymes of two linseed (*Linum usitatissimum* L.) accessions differing in drought tolerance. ***Pakistan Journal of Botany, 54(3): 843-853. DOI: http://dx.doi.org/10.30848/PJB2022-3(2)***.
96. Maqsood, M. F., **M. Shahbaz,** S. Kanwal, M. Kaleem, S. M. R. Shah, M. Luqman, I. Iftikhar, U. Zulfiqar, A. Tariq, S. A. Naveed, N. Inayat, A. M. U. Din, M. Uzair, M. R. Khan and F. Farhat. **2022**. Methionine promotes the growth and yield of wheat under water deficit conditions by regulating the antioxidant enzymes, reactive oxygen species, and ions. ***Life, 12: 969. https://doi.org/10.3390/life12070969.***
97. Abid, A. and **M. Shahbaz. 2022.** Influence of exogenously applied trehalose on morphological and physiological traits of flax (*Linum usitatissimum*) plant under water shortage conditions. ***Pakistan Journal of Agricultural Sciences, 59(3): 435-448. DOI:10.21162/PAKJAS/22.52***
98. Lalarukh, I., S. A. Al‐Dhumri, L. K. T. Al‐Ani, M. Shahbaz, S. F. Amjad, N. Mansoora, W. B. Al‐Shammari, F. S. Alhusayni, M. M. Almutari. **2022.** Combined application of poultry litter biochar with NPK fertilizer mitigates the effects of stress in wheat (*Triticum aestivum* L.) grown on chromium contaminated soil. ***Plant and Soil, 480: 201-212. https://doi.org/10.1007/s11104-022-05574-3***
99. Shahid, S., M. Shahbaz, M. F. Maqsood, F. Farhat, U. Zulfiqar, T. Javed, M. F. Ali, M. Alhomrani and A.S. 2022. Proline-induced modifications in morpho-physiological, biochemical and yield attributes of pea (*Pisum sativum* L.) cultivars under salt stress. ***Sustainability, 14: 13579. https://doi.org/10.3390/su142013579***
100. Iftikhar, I., **M. Shahbaz** and M. A. Wahid. **2023**. Potential role of foliage applied strigolactone (GR24) on photosynthetic pigments, gas exchange attributes, mineral nutrients and yield components of *Zea mays* (L.) under saline regimes. ***Gesunde Pflanzen, 77: 577-591. https://doi.org/10.1007/s10343-022-00720-4(IF=3.1)***
101. Mujahid, N., **M. Shahbaz**, A. Kiran and M A. Wahid. **2023**. Modulations induced by seed priming of strigolactone (GR24) in morpho‐physiological and biochemical attributes of ajwain (*Trachyspermum ammi* L.) under salt stress. ***Journal of Plant Growth Regulation, 42: 2893-2906. https://doi.org/10.1007/s00344-022-10755-6(IF=4.8)***
102. Farooqi, Z. U. R., M. Sabir, H. R. Ahmad, **M. Shahbaz** and J. Smith. **2023.** Reclaimed salt-affected soils can effectively contribute to carbon sequestration and food grain production: Evidence from Pakistan. ***Applied Sciences, 13:1436. https://doi.org/10.3390/app13031436.(IF=2.7)***

103. Luqman, M., **M. Shahbaz** and E. A. Waraich. **2023**. Effect of different concentrations of GR24 as seed priming treatment on physio-chemical and yield related attributes of maize (*Zea mays*) hybrids under drought stress. ***Pakistan Journal of Botany, 55(4): 1257-1266. DOI: http://dx.doi.org/10.30848/PJB2023-4(24).(IF=1.2)***
104. Maqsood, M. F., **M. Shahbaz,** U. Zulfiqar, R. U. Saman, A. Rehman, N. Naz, M. Akram and F. U. Haider. **2023**. Enhancing wheat growth and yield through salicylic acid-mediated regulation of gas exchange, antioxidant defense, and osmoprotection under salt stress. ***Stresses, 3:372–386. DOI:https://doi.org/10.3390/stresses3010027.(IF=0)***
105. Sadia, H., **M. Shahbaz**, A. Kiran and M. F. Saleem. **2023**. Interactive effect of salicylic acid and ascorbic acid on gaseous exchange and mineral nutrients of chicory (*Cichorium intybus* L.) under saline conditions. ***Pakistan Journal of Botany, 55(6): 1999-2012. DOI: http://dx.doi.org/10.30848/PJB2023-6(22).(IF=1.2)***
106. Nawaz, S., A. Wahid, **M. Shahbaz** and S. M. A. Basra. **2023**. Evaluation of heat stress induced plant metabolites in *Fagopyrum esculentum* Moench. by exogenous application of plant growth promoters. ***Energy & Environment, 0(0). https://doi.org/10.1177/0958305X231192355.***
107. Khokhar, A., **M. Shahbaz**, M. F. Maqsood, U. Zulfiqar, N. Naz, U. Z. Iqbal, M. Sara, M. Aqeel, N. Khalid, A. Noman, F. Zulfiqar, K. M. Al Syaad and M. A. AlShaqhaa. **2023**. Genetic modification strategies for enhancing plant resilience to abiotic stresses in the context of climate change. ***Functional & Integrative Genomics, 23:283. https://doi.org/10.1007/s10142-023-01202-0 (IF=2.9)***
108. Saman, R. U., **M. Shahbaz,** M. F. Maqsood, N. Lili, U. Zulfiqar, F. U. Haider, N. Naz and B. Shahzad. **2023**. Foliar application of ethylenediamine tetraacetic acid (EDTA) improves the growth and yield of brown mustard (*Brassica juncea*) by modulating photosynthetic pigments, antioxidant defense, and osmolyte production under lead (Pb) stress. ***Plants, 12: 115. https://doi.org/10.3390/plants12010115.(IF=4.5)***
109. Ramzan, T., **M. Shahbaz,** M. F. Maqsood, U. Zulfiqar, R. U. Saman, N. Lili, M. Irshad, S. Maqsood, A. Haider, B. Shahzad, A-R. Z. Gaafar and F. U. Haider. **2023**. Phenylalanine supply alleviates the drought stress in mustard (Brassica campestris) by modulating plant growth, photosynthesis, and antioxidant defense system. ***Plant Physiology and Biochemistry, 201: 107828. https://doi.org/10.1016/j.plaphy.2023.107828.(IF=6.5)***
110. Luqman, M., **M. Shahbaz**, M. F. Maqsood, F. Farhat, U. Zulfiqar, M. H. Siddiqui, A. Masood, M. Aqeel and F. U. Haider. **2023**. Effect of strigolactone on growth, photosynthetic efficiency, antioxidant activity, and osmolytes accumulation in different maize (*Zea mays* L.) hybrids grown under drought stress. ***Plant Signaling & Behavior, DOI: 10.1080/15592324.2023.2262795.(IF=2.9)***
111. Khalid, F., K. Asif, Y. Rasheed, H. Ashraf, M. F. Maqsood, S. Rana, U. Zulfiqar, N. Naz, **M. Shahbaz,** R. Sardar and Z. Riaz. **2023**. Nano priming for boosting growth and resilience in crops under abiotic stresses. ***Biocatalysis and Agricultural Biotechnology, 53 (2023) 102892: DOI: https://doi.org/10.1016/j.bcab.2023.102892.***
112. Maqsood, M. F., **M. Shahbaz**, F. Khalid, Y. Rasheed, K. Asif, N. Naz, U. Zulfiqar, F. Zulfiqar, A. Moosa, K. H. Alamer and H. Attia. **2023**. Biogenic nanoparticles application in agriculture for ROS mitigation and abiotic stress tolerance: A review. ***Plant Stress, 10 (2023) 100281. DOI: https://doi.org/10.1016/j.stress.2023.100281.***
113. Dhillon, S. A., N. Mujahid, **M. Shahbaz** and A. Debez. **2023**. Response of sesame (*Sesamum indicum* L.) to foliar-applied thiourea under saline conditions. International

Journal of Applied and Experimental Biology, 2: 167-177.doi:10.56612/ijaeb.v2i2.54

114. Islam, F., M. Hameed, **M. Shahbaz** and M.A. Wahid. **2024.** Diversity in wild olive (*Olea europaea* subsp. *cuspidata*) communities along elevational gradient. ***Pakistan Journal of Botany, 56(1): 149-160. DOI: http://dx.doi.org/10.30848/PJB2024-1(21).(IF=1.2)***
115. Qadeer, A., M. Yaseen, M. Naveed and **M. Shahbaz. 2024**. Effect of urea-phosphate and its application methods on maize (*Zea mays* L.) growth, yield and nutrient use efficiency. ***Applied Ecology and Environmental Research X(y): pp-pp. DOI: http://dx.doi.org/10.15666/aeer.***
116. Atta, N., **M. Shahbaz**, F. Farhat, M. F. Maqsood, U. Zulfqar, N. Naz, M. M. Ahmed, N. Hassan, N. Mujahid, A. El‐Zaher, M. A. Mustafa, M. S. Elshikh and T. Chaudhary. **2024**. Proline‐mediated redox regulation in wheat for mitigating nickel‐induced stress and soil decontamination. ***Scientific Reports | (2024) 14:456. https://doi.org/10.1038/s41598-023-50576-5***.
117. Fiaz, K., M. F. Maqsood, **M. Shahbaz**, U. Zulfiqar, N. Naz, A-R. Z. Gaafar, A. Tariq, F. Farhat, F. U. Haider and B. Shahzad. **2024**. Application of thiourea ameliorates drought induced oxidative injury in *Linum usitatissimum* L. by regulating antioxidant defense machinery and nutrients absorption. ***Heliyon, 10:e25510. https://doi.org/10.1016/j.heliyon.2024.e25510***
118. Zulfiqar, U., A. Khokhar, M. F. Maqsood, **M. Shahbaz**, N. Naz, M. Sara, S. Maqsood, S. Sahar, S. Hussain and M. Ahmad. **2024**. Genetic biofortification: advancing crop nutrition to tackle hidden hunger. ***Functional & Integrative Genomics, 24:34. https://doi.org/10.1007/s10142-024-01308-z***
119. Iqbal, R., **M. Shahbaz**, M. Z. Mansha, K. Ikram, I. Khalid, U. Tariq, M. H. Siddiqui, A-R. Z. Gaafar, M. S. Hodhod, K. Ashraf and Q. U. Zaman. **2024**. Enhancing crop resilience through thiamine: implications for sustainable agriculture in drought-stressed radish. ***Notulae Botanicae Horti Agrobotanici Cluj-Napoca, 52(1): 13472. D DOI:10.15835/nbha52113472***
120. Misbah and M. **Shahbaz. 2024**. Effect of thiourea as root growing medium on growth, photosynthetic pigments, ions and yield attributes of cotton under drought stress. ***Journal of Xi'an Shiyou University, Natural Science Edition, 20(5): 405-438.***
121. Rasheed, Y., F. Khalid, H. Ashraf, K. Asif, M. F. Maqsood, N. Naz, **M. Shahbaz**, U. Zulfiqar, Q. Ali and S. Rana. **2024**. Enhancing Plant Stress Resilience with Osmolytes and Nanoparticles. ***Journal of Soil Science and Plant Nutrition, https://doi.org/10.1007/s42729-024-01821-x***
122. Kanwal, R., M. F. Maqsood, **M. Shahbaz**, N. Naz, U. Zulfiqar, M. F. Ali, M. Jamil, F. Khalid, Q. Ali, M. A. Sabir, T. Chaudhary, H. M. Ali and W. A. A. Alsakkaf. **2024**. Exogenous ascorbic acid as a potent regulator of antioxidants, osmo-protectants, and lipid peroxidation in pea under salt stress ***BMC Plant Biology, 24:247. https://doi.org/10.1186/s12870-024-04947-3.***
123. Zeeshan, N., G. Murtaza, H. R. Ahmad, A. N. Awan, **M. Shahbaz** and P. Freer‐Smith. **2024**. Particulate and gaseous air pollutants exceed WHO guideline values and have the potential to damage human health in Faisalabad, Metropolitan, Pakistan. ***Environmental Monitoring and Assessment, 196:659. https://doi.org/10.1007/s10661-024-12763-3***
124. Ilyas, M., M. F. Maqsood, **M. Shahbaz**, U. Zulfiqar, K. Ahmad, N. Naz, M. F. Ali, M. Ahmad, Q. Ali, J. W. H. Yong and H. M. Ali. **2024**. Alleviating salinity stress in canola (*Brassica napus* L.) through exogenous application of salicylic acid. ***BMC Plant Biology,***

24:611. https://doi.org/10.1186/s12870-024-05314-y

125. Majid, S. M. and M. **Shahbaz. 2024**. β-carotene induced alteration in morphological and physiological aspects of fennel (*Foeniculum vulgare* Mill.) under salt stress. ***Journal of Xi'an Shiyou University, Natural Science Edition, 20(6): 181-215.***
126. Basharat, Z. and M. **Shahbaz. 2024**. Morpho-physiological and biochemical responses of flax (*Linum usitatissimum* L.) to exogenously applied glycinebetaine under water deficit conditions. ***Journal of Xi'an Shiyou University, Natural Science Edition, 20(7): 664-700.***
127. Iftikhara, I., **M. Shahbaza**, M. F. Maqsood, U. Zulfiqar, S. Rana, F. Farhat, H. Farooq, K. Ahmad, M. Jamil, F. U. Haider and S. Aghayeva. **2024**. Resilient mechanism of strigolactone (GR24) in regulating morphological and biochemical status of maize under salt stress. ***Biocatalysis and Agricultural Biotechnology, 60 (2024): 103340. https://doi.org/10.1016/j.bcab.2024.103340***
128. Masood, A., S. Arooj, **M. Shahbaz**, N. Khalid, M. Sajjad, M. F. Maqsood, S. K. Chaudhari, A. Abid, R. Zainab, N. Fatima. **2024**. Exploring the morpho‑physiological responses of maize to nickel stress modulated by salicylic acid. ***Cereal Research Communications, https://doi.org/10.1007/s42976-024-00567-7.***
129. Basharat, Z., **M. Shahbaz** and E. A. Waraich. **2024**. Potential role of pre-sowing seed treatment with glycinebetaine in antioxidants machinery, growth and biochemical attributes of flax (*Linum usitatissimum* L.) under water deficit conditions. ***Xi'an Shiyou Daxue Xuebao (Ziran Kexue Ban)/Journal of Xi'an Shiyou University, Natural Sciences Edition. 67(9): 241-255. DOI: 10.5281/zenodo.13756913***.
130. Khalid, F., Y. Rasheed, K. Asif, H. Ashraf, M. F. Maqsood, **M. Shahbaz**, U. Zulfiqar, R. Sardar, F. U. Haider. **2024**. Plant biostimulants: Mechanisms and applications for enhancing plant resilience to abiotic stresses. ***Journal of Soil Science and Plant Nutrition, https://doi.org/10.1007/s42729-024-01996-3.***
131. Khursheed, M. H. U. R., **M. Shahbaz**, T. Ramzan, A. Haider, M. F. Maqsood, A. Khan, U. Zulfiqar, M. Jamil, S. Hussain, A. A. Al-Ghamdi and H. Rizwana. **2024**. Enhancing wheat tolerance to Cadmium stress through moringa leaf extract foliar application. ***Scientifica, 2024: 2919557. https://doi.org/10.1155/2024/2919557.***
132. Naz, F., M. S. A. Ahmad, **M. Shahbaz** and F. Rasul. **2024**. Comparison of exogenous proline application methods in enhancing salinity tolerance of flex (*Linum usitatissimum* L.). ***Pakistan Journal of Botany, 57(2): DOI: http://dx.doi.org/10.30848/PJB2025-2(13).***
133. Baloch, R., M. F. Saleem, **M. Shahbaz** and M. Sarwar. **2024**. Evaluation of basmati rice (*Oryza sativa* L.) genotypes for seedling growth and leaf physiology under high-temperature stress. ***Journal of Agronomy and Crop Science, 2024; 210:e12777. https://doi.org/10.1111/jac.12777***.
134. Mujahid, N. and **M. Shahbaz. 2024.** Seed priming with strigolactone GR24 develops tolerance toward salinity in ajwain (*Trachyspermum ammi* L.) by improving mineral nutrient contents and yield. ***Acta Physiologiae Plantarum (2024) 46:105 https://doi.org/10.1007/s11738-024-03717-w***
135. Shehzadi, K, M. F. Maqsood, R. Kanwal, **M. Shahbaz**, M. Naqve, U. Zulfiqar, M. Jamil, N. Khalid, M. F. Ali and W. Soufan. **2025**. Enhancing cadmium stress resilience in chickpea (*Cicer arietinum* L.) via exogenous melatonin application. ***International Journal of Phytoremediation, DOI: 10.1080/15226514.2024.2448464.***
136. Chishti, M. S., **M. Shahbaz**, M. Kaleem, S. Shafi, A. Mehmood, Z. Qingzhu, M. Mansha, N. Shehzadi, S. Rana, H. Shahid, A. Hashem, A. Alfagham and E. F. Abd-Allah. **2025**.

Fertigation with alpha-tocopherol enhances morphological, physiological, and antioxidant responses in radish (*Raphanus sativus* L.) under drought stress. ***BMC Plant Biology (2025) 25:30. https://doi.org/10.1186/s12870-025-06052-5***

137. Khalid, F., Y. Rasheed, H. Ashraf, K. Asif, M. F. Maqsood, **M. Shahbaz,** U. Zulfiqar, F. Farhat, S. Nawaz and M. Ahmad. **2025**. Nanoparticle-Mediated Phytohormone Interplay: Advancing Plant Resilience to Abiotic Stresses. ***Journal of Crop Health 77:56. https://doi.org/10.1007/s10343-025-01121-z***
138.

Abstracts published in Conferences/Symposia/Meetings:

1. Batool, S., M. Hameed, **M. Shahbaz** and Q. Ali. 2008. Eeffect of drought stress on foliar anatomy of *Panicum antidotale* retz. ecotypes. **(1st International Conference of Plant Scientists (10th National Meeting of Plant Scientists)"** held on 21-24 April, 2008 at Department of Botany, University of Agriculture, Faisalabad-Pakistan.
2. Nawazish, S., M. Hameed, **M. Shahbaz** and N. A. Akram. 2008. Effect of water stress on anatomy of *Cynodon dactylon* L. ecotype from the salt range. **(1st International Conference of Plant Scientists (10th National Meeting of Plant Scientists)"** held on 21-24 April, 2008 at Department of Botany, University of Agriculture, Faisalabad-Pakistan.
3. Serwar, Y., M. Hameed, **M. Shahbaz**, F. Jabeen and M. Mughal. 2008. Leaf anatomical adaptations in *Cenchrus setigerus* and *Sporobolus arabicus* from the salt range, Pakistan under drought stress. **(1st International Conference of Plant Scientists (10th National Meeting of Plant Scientists)"** held on 21-24 April, 2008 at Department of Botany, University of Agriculture, Faisalabad-Pakistan.
4. Bukhari, I., **M. Shahbaz** and H. Imtiaz. 2008. Effect of foliar application of urea on sunflower under saline. **(1st International Conference of Plant Scientists (10th National Meeting of Plant Scientists)"** held on 21-24 April, 2008 at Department of Botany, University of Agriculture, Faisalabad-Pakistan.
5. **Shahbaz, M**. and G. Naheed. 2008. Interactive effect of rooting medium application of phosphorus and NaCl on plant biomass and mineral nutrients of rice (*Oryza sativa* L.). **(1st International Conference of Plant Scientists (10th National Meeting of Plant Scientists)"** held on 21-24 April, 2008 at Department of Botany, University of Agriculture, Faisalabad-Pakistan.
6. Akram, N. A., S. Nawazish, **M. Shahbaz** and M. Hameed. 2008. Influence of drought on mineral nutrients of differentially adapted populations of *Cynodon dactylon* (L.) Pers. and *Cenchrus ciliaris* L. **(1st International Conference of Plant Scientists (10th National Meeting of Plant Scientists)"** held on 21-24 April, 2008 at Department of Botany, University of Agriculture, Faisalabad-Pakistan.
7. Jabeen, F. and **M. Shahbaz**. 2008. Response of two differentially adapted populations of *Cenchrus setigerus* Vahl to drought stress. **(1st International Conference of Plant Scientists (10th National Meeting of Plant Scientists)"** held on 21-24 April, 2008 at Department of Botany, University of Agriculture, Faisalabad-Pakistan.

8. **Shahbaz, M.** and S. Perveen. 2011. Regulation in morpho-physiological and biochemical attributes of wheat (Triticum aestivum L.) by exogenous application of triacontanol under salt stress (**2nd International Conference of Plant Scientists (11th National Meeting of Plant Scientists)"** held on 22-24 February, 2011 at Department of Botany, GC University Lahore-Pakistan).
9. Perveen, S. and **M. Shahbaz.** 2011**.** Response of wheat (Triticum aestivum L.) cultivars to exogenous application of triacontanol under salt stress conditions (**2nd International Conference of Plant Scientists (11th National Meeting of Plant Scientists)"** held on 22-24 February, 2011 at Department of Botany, GC University Lahore-Pakistan)
10. Shaheen, H.L. and **M. Shahbaz.** 2011. Morpho-physiological responses of cotton (*Gossypium hirsutum* L.) genotypes to salt stress. **(2nd International Conference of Plant Scientists (11th National Meeting of Plant Scientists)"** held on 22-24 February, 2011 at Department of Botany, GC University Lahore-Pakistan)
11. Kausar, F. and **M. Shahbaz.** 2012. Interactive effect of foliar application of nitric oxide (NO) and salinity on wheat (*Triticum aestivum* L.). **(12th National & 3rd International Conference of Botany)** held on 01-03 September, 2012 at Quaid-i-Azam University, Islamabad- Pakistan.
12. Zulfiqar, S. and **M. Shahbaz.** 2012. Response of canola (*Brassica napus* L.) to foliar applied triacontanol under saline and non-saline conditions. **(12th National & 3rd International Conference of Botany)** held on 01-03 September, 2012 at Quaid-i-Azam University, Islamabad- Pakistan.
13. Kausar, F. and **M. Shahbaz.** 2013. Protective role of exogenously applied nitric oxide in alleviation of adverse effects of salt stress on wheat (*Triticum aestivum* L.). **(International Conference on Crop Management in Changing Climate)** held on February 11-13, 2013 at University of Agriculture, Faisalabad.
14. Masood, A. and M. Shahbaz. 2016. Influence of foliar applied phospholipase C inhibitor U-73122 on rice (Oryza sativa L.) plants under salt stress conditions. (MECP-143: "International Conference on Major Environmental Constraints to Plants: Assessment and Reclamation" held on 28-30 March, 2016 at Department of Botany, Government College University, Faisalabad-Pakistan.
15. Kausar, F. and M. Shahbaz. 2016. Influence of strigolactone (GR24) on growth, gas exchange and chlorophyll fluorescence of wheat (Triticum aestivum L.) under saline conditions. (MECP-192)
16. Ali, H. M. M., S. Perveen and M. Shahbaz. 2016. Potential role of alfalfa leaf extract on growth and physio-chemical attributes of wheat (Triticum aestivum L. Poaceae) under cadmium stress. (MECP-195)
17. Shahbaz, M. and M. Luqman. 2016. Variation in morphological, physiological and biochemical attributes of sunflower (*Helianthus annuus* L.) to foliar applied strigolactone (GR24) under salt stress. (MECP-293)
18. Lalarukh, I. and **M. Shahbaz. 2017**. Lipid peroxidation and antioxidants response of sunflowers to Alpha-tocopherol pre-sowing seed treatment under salt stress. (First International Conference on "**Conventional and Modern Approaches in Plant Sciences**") held on November 28-29, 2017 organized by Department of Botany, University of the Punjab, Lahore.
19. Tariq, A. and **M. Shahbaz. 2017**. Pre-sowing seed treatment of glycine betaine mitigates saline effects in sesame (*Sesamum indicum* L.). (First International Conference on

"**Conventional and Modern Approaches in Plant Sciences**") held on November 28-29, 2017 organized by Department of Botany, University of the Punjab, Lahore.

20. Abid, A. and **M. Shahbaz.** 2019. Interactive effect of Trehalose and drought stress conditions on isabgol (*Plantago ovata* L.) (WSPPS-59; 2nd International Conference on Water Saving and Plant Production Strategies: Constraints and Implications for Sustainable Agriculture" held on March 26-28, 2019 at Department of Botany, Government College University, Faisalabad-Pakistan.

21. Lalarukh, I., **M. Shahbaz,** A. Wahid and S. M. A. Basra. 2019. Alpha-tocopherol induced modulations in osmotic adjustment of sunflower in salt stress. (WSPPS-66).

22. Maqsood, M. F. and **M. Shahbaz.** 2019. Pre-sowing treatment with glycinebetaine-induced modulation in photosynthetic pigments and gas exchange parameters of quinoa under salt stress. (WSPPS-68).

23. Mujahid, N., **M. Shahbaz,** A. Wakeel and A. Kiran. 2019. Mitigation of water deficit impacts on morpho-physiological attributes of sunflower (*Helianthus annuus* L.) by exogenous application of salicylic acid. (WSPPS-72).

24. Riaz, Z. and **M. Shahbaz.** 2019. Modulation in growth and gas exchange characteristics of cotton (*Gossypium hirsutum* L.) by foliar-applied thiourea under saline conditions. (WSPPS-75).

25. Saddique, M. and **M. Shahbaz.** 2019. Impact of pre-sowing seed treatment with alpha-tocopherol on oxidative defense system of eggplant (*Solanum melongena* L.) under drought stress conditions. (WSPPS-76)

26. Dhillon, S. A., N. Mujahid and M. Shahbaz. 2019. Response of sesame (*Sesamum indicum* L.) to foliar-applied thiourea under saline conditions. (WSPPS-106).

27.

Workshops/Seminars attended:

1. Qualified two weeks **"Research Orientation Program (2nd Course)"** held on 21st September to 6th October, 2004 by the University of Agriculture, Faisalabad.

2. **Higher Education Commission (HEC) Workshop:** on "Imparting Practical Training in Advanced Plant Biology Techniques to College Teachers" held on 11-16 October, 2004 by the Department of Botany, University of Agriculture Faisalabad.

3. **Higher Education Commission (HEC) Workshop:** on "Advances in Plant Physiology" held on 14-16 November, 2005 by the Department of Botany, University of Agriculture Faisalabad.

4. **Higher Education Commission (HEC) Workshop:** on "Imparting Practical Training in Biochemical Techniques" held on Feb 27-March 4, 2006 by the Departments of Chemistry and Botany, University of Agriculture Faisalabad.

5. **National Seminar on "Soil Care for Sustainable Environment"** held on 16-17 May, 2006 by the Institute of Soil and Environmental Sciences, University of Agriculture, Faisalabad.

6. **Higher Education Commission (HEC) Workshop:** on **"Advances in Plant Ecology: Ecophysiological Constraints of Plants"** held on December 17-19, 2007 by the Department of Botany, University of Agriculture, Faisalabad.

7. One-day seminar on **"Role of Botanical Sciences in Agricultural Development"** held on November 4, 2011 by Department of Botany, University of Agriculture, Faisalabad (organizing committee).

8. First national seminar of Pakistan Allelopathy Society "**Allelopathy research in Pakistan: Experiences and Opportunities**" held on December 12, 2013 organized by Departments of Botany, Crop Physiology and Agronomy, University of Agriculture, Faisalabad (organizing committee).
9. Training Workshop on "**Self Assessment Report (SAR)**" held on March 24, 2014 organized by Quality Enhancement Cell, University of Agriculture, Faisalabad.
10. International workshop on "**Building Capacity for Intellectual Property Management and Technology Transfer**" held on November 09-11, 2015 organized by U.S. Pakistan Center for Advanced Studies in Agriculture and Food Security and Office of Research, Innovation and Commercialization, University of Agriculture, Faisalabad.
11. One day workshop on "**Holding Effective Seminars: Engaging the Audience**" held on January 12, 2016 organized by the Office of Research, Innovation and Commercialization, University of Agriculture, Faisalabad.
12. One day workshop on "**Strategic Use of Digital Technology in University Instruction**" held on October 17, 2016 organized by the U.S.-Pakistan Center For Advanced Studies in Agriculture and Food Security, University of Agriculture, Faisalabad.
13. Capacity Building Workshop on "**Biosafety Measures in Agriculture**" held on February 20-21, 2017 organized by the Office of Research, Innovation and Commercialization, University of Agriculture, Faisalabad.
14. One day seminar on "**Intellectual Property Rights**" held on November 01, 2017 organized by the Office of Research, Innovation and Commercialization, University of Agriculture, Faisalabad.
15. Invited Speaker in **"One Day Training Workshop on Bioassays for Exploration of Bioactives"** held on March 20, 2018 at Department of Biochemistry, University of Agriculture, Faisalabad (**Topic of talk:** Antioxidants as Markers for Stress Tolerance).
16. Participated in One day International Seminar on **"Impact of Climate Change on Vegetation"** held on March 28, 2019 at Department of Botany, Government College Women University, Faisalabad-Pakistan.
17. Participated in One Day Workshop on **"Patent/Claims, Drafting Techniques, Industrial Design and Trademark Registration"** held on November 21, 2019 organized by Technology and Innovation Support Center (TISC) CAS Auditorium of University of Agriculture, Faisalabad.
18. Guest Speaker in a national seminar on **"World Environment day"** online held on June 5, 2020 organized by Department of Botany, University of Lahore, Sargodha Campus.

19. Invited Speaker in 2nd National tow-day training Workshop on **"Bioassays for Exploration of Bioactives"** held on October 25-26, 2021 at Department of Biochemistry, University of Agriculture, Faisalabad (**Topic of talk:** Plants/Animal Biomarkers).
20. Guest Speaker in one day seminar on **"Green Plants as Intelligent Organism"** held on March 13, 2022 at Department of Botany, The University Lahore, Sargodha Campus.
21.

Conferences/Symposia/Meetings:

1. Participated in an International Plant Science Conference on, **"Application of Plant Sciences in Emerging Scenario"** held on 18-20 February, 2006 at Department of Botany, GC University, Faisalabad-Pakistan.
2. Participated in an International Symposium on, **"Strategies for Crop Improvement against Abiotic Stresses"** held on 18-20 September, 2006 at Department of Botany, University of Agriculture, Faisalabad-Pakistan.
3. Participated in **"1st International Conference of Plant Scientists (10th National Meeting of Plant Scientists)"** held on 21-24 April, 2008 at Department of Botany, University of Agriculture, Faisalabad-Pakistan.
4. Participated in Scientific Meeting on **"Chemistry Related to Biological and Medical Sciences"** held on 7-9 December, 2009 at Veldhoven, The Netherlands.
5. Presented a paper in **"2nd International Conference of Plant Scientists (11th National Meeting of Plant Scientists)"** held on 22-24 February, 2011 at Department of Botany, GC University Lahore-Pakistan.
6. Participated in **"10th International and 22nd National Chemistry Conference 2011"** held on 21-23 November, 2011 at Department of Chemistry and Biochemistry, University of Agriculture, Faisalabad-Pakistan.
7. Participated (organizing committee) in an international symposium on **"Strategies for Conservation of Endangered Ecosystems"** held on 16-18 April, 2012 at Department of Botany, University of Agriculture, Faisalabad-Pakistan.
8. Participated in **"International Conference on Climate Change Issues and Conference of Parties (COP 21)"** held on 19 May, 2015 at Department of Agronomy, University of Agriculture, Faisalabad-Pakistan.
9. Participated in **"International Conference on Major Environmental Constraints to Plants: Assessment and Reclamation"** held on 28-30 March, 2016 at Department of Botany, Government College University, Faisalabad-Pakistan.
10. Participated in "**International Symposium on Establishment of Vegetables Garden with Organic Fertilizers**" held on March 13, 2017 at Department of Botany, Government College University, Faisalabad-Pakistan.
11. Keynote speaker in one day symposium on **"Deforestation Versus Reforestation"** held on March 22, 2018, organized by Department of Botany, Horticulture Society, Environment Research Group, Government College Women University, Faisalabad.
12. Participated and Co-Chair a session in **"2nd International Conference on Water Saving and Plant Production Strategies: Constraints and Implications for Sustainable**

Agriculture" held on March 26-28, 2019 at Department of Botany, Government College University, Faisalabad-Pakistan.

13. Co-Chair a technical session "Plant Physiology and Seed Science Technology" in an **International Online Conference on "Dynamic Strategies in Plant Sciences for Crop Sustainability and Food Security"** held on May 26-27, 2021 organized by Department of Botany, Government College Women University Faisalabad-Pakistan.
14. Co-Chair a technical session in an online webinar on **"Plants, Abiotic Stresses and Economy: Scenario and Strategies Worldwide"** held on July 14-15, 2021 organized by Department of Botany, Government College University Faisalabad-Pakistan.
15. Participated in **"International Conference on Biodiversity and Biosafety (ICBB)"** held on May 27-29, 2024 organized by University of Agriculture, Faisalabad-Pakistan.
16.

Research Supervised:

A: (M.Sc.)		**Number of Students**		
	Role	**Supervised and Awarded Degree**	**In Progress**	**Total**
	Supervisor:	65	0	**65**
	Member:	60	0	**60**
			Grand Total:	**125**
B: (M.Phil/MS)				
	Supervisor:	182	45	**227**
	Member:	808	150	**958**
			Grand Total:	**1185**
C. (Ph.D.)				
	Supervisor:	17	9	**26**
	Member:	23	20	**43**
			Grand Total:	**69**
		Grand Total (A + B + C):		**1379**

Students Supervised by Dr. Muhammad Shahbaz Assistant Professor, Department of Botany, University of Agriculture, Faisalabad up to 2024

Ph. D. Students as Major Supervisor				
No	**Name**	**Title**	**Year**	**University**
		2012		
1.	Dr. Shagufta Perveen 2005-ag-47	Effect of exogenous application of triacontanol on wheat (*Triticum aestivum* L.) under salt stress	2012	UAF
2.	Dr. Huma Lubna Shaheen 2003-ag-443	Gene expression and morpho-physiological responses of cotton (*Gossypium hirsutum* L.) to salt stress	2012	UAF
		2015		
3.	Dr. Robina Aziz 2003-ag-510	Influence of exogenous application of triacontanol on various morpho-physiological and biochemical attributes of sunflower (*Helianthus annuus* L.) under saline conditions	2015	UAF
		2016		
4.	Dr. Atifa Masood 2009-ag-700	Morpho-physiological and biochemical responses of rice (*Oryza sativa* L.) to saline stress	2016	UAF
		2017		
5.	Dr. Farhana Kausar 2006-ag-627	Influence of Strigolactone (GR24) on growth, physiological and biochemical attributes of wheat (*Triticum aestivum* L.) under saline conditions	2017	UAF
6.	Dr. Irfana Lalarukh 2013-ag-549	Role of exogenously applied alpha tocopherole in acclimatization of sunflower (*Helianthus annuus* L.) to salinity stress	2017	UAF
		2018		
7.	Dr. Yasmin Sarwar 2002-ag-1235	Modulation in growth, physiological and biochemical attributes of sunflower (*Helianthus annuus* L.) by GR24 application under saline stress	2018	UAF
8.	Dr. Maria Naqve 2012-ag-73	Response of okra [*Abelmoscus esculentus* (L.) Moench] to exogenously application of alpha tocopherole as foliar spray and pre-seed treatment under saline conditions	2018	UAF
9.	Dr. Maham Saddique 2014-ag-21	Response of eggplant (*Solanum melongena* L.) to exogenously applied alpha tocopherole under drought stress conditions	2018	UAF
		2021		
10.	Dr. Muhammad Faisal Maqsood 2012-ag-1	Morpho-physiological, biochemical and yield responses of quinoa (*Chenopodium quinoa* L.) to exogenously applied glycinebetaine under saline conditions	2021	UAF
		2022		
11.	Dr. Iqra Iftikhar 2013-ag-1392	Strigolactone (GR24) induced responses in maize (*Zea mays* L.) under saline conditions	2022	UAF
12.	Dr. Nazoora Mujahid 2015-ag-201	Strigolactone (GR24) induced alteration in morpho-physiological, biochemical and yield attributes of ajwain (*Trachyspermum ammi* L.) under salt stress	2022	UAF

2023				
13.	Dr. Muhammad Luqman 2012-ag-8	Variation in morpho-physiological and biochemical attributes of maize (*Zea mays* L.) to exogenously applied strigolactone (GR24) as foliar spray and pre-seed treatment under drought stress conditions	2023	UAF
14.	Dr. Haleema Sadia 2013-ag-1118	Interactive effect of salicylic acid and ascorbic acid on chicory (*Cichorium intybus* L.) under saline conditions	2023	UAF
2024				
15.	Dr. Abida Abid 2012-ag-34	Influence of exogenously applied trehalose as pre-sowing seed treatment or foliar spray on flax (*Linum usitatissimum* L.) under drought stress conditions	2024	UAF
16.	Dr. Misbah 2012-ag-644	Alteration in morphological, physiological and biochemical attributes of cotton (*Gossypium hirsutum* L.) in response to exogenous application of thiourea under water deficit conditions	2024	UAF
17	Dr. Zyma Basharat 2014-ag-1706	Morpho-physiological and biochemical responses of flax (*Linium usitatissimum* L.) to exogenously applied glycinebetaine under water deficit conditions	2024	UAF

Ph. D. Students as Committee Member				
No	**Name**	**Title**	**Year**	**University**
2011				
1.	Dr. Samina Tanwir 2005-ag-80 (Botany)	Effect of exogenous application of ascorbic acid on wheat (*Triticum aestivum* L.) under drought stress and QTL mapping for drought tolerance	2011	UAF
2012				
2.	Dr. Muhammad Arslan Ashraf 2002-ag-1125 (Botany)	Physiological and molecular characterization of two genetically diverse spring wheat (*Triticum aestivum* L.) cultivars for salt tolerance	2012	UAF
2013				
3.	Dr. Muhammad Iqbal Hussain 1997-ag-1024 ISES	Isolation of bacterial with phosphatase activity for increasing yield of maize	2013	UAF
4.	Dr. Noman Habib 2003-ag-491 Botany	Regulation of growth and some key physiological and biochemical attributes in salt stressed plants of rice (*Oryza sativa* L.) by exogenous application of nitric oxide	2013	UAF
2014				
5.	Dr. Rana Nauman Shabbir 2007-ag-11 Crop Physiology	Nutrient management strategies for alleviation of drought stress in wheat (*Triticum aestivum* L.)	2014	UAF
6.	Dr. Fahim Nawaz 2003-ag-1820 Crop Physiology	Wheat (*Triticum aestivum* L.) response to exogenous selenium supply under drought stress	2014	UAF
2015				
7.	Dr. Hafiz Muhammad	Bioremediation of petroleum hydrocarbon contaminated soil by indigenous bacteria in association	2015	UAF

	Rafique 2001-ag-2581 ISES	with plant		
8.	Dr. Zahoor Ahmad 2005-ag-1658 Crop Physiology	Maize (*Zea mays* L.) responses to supplemental foliar applied phosphorus under drought stress	2015	UAF
9.	Dr. Zeeshan Ahmed 2008-ag-514 Crop Physiology	Characterization and evaluation of *Camelina sativa* as potential oil seed crop under water limited environment	2015	UAF
2018				
10.	Dr. Kanval Shaukat 2014-ag-823 Botany	Cross-adaptability mechanism of two lemongrass populations from Faisalabad and Quetta regions in Pakistan	2018	UAF
11.	Dr. Rashda Naheed 1991-ag-1498 Botany	Enhancing and evaluating drought tolerance in *Saccharum officinarum* L. using molecular toolbox	2018	UAF
12.	Dr. Naila Hadayat Ullah 2009-ag-105 Botany	Heavy metal pollution from vehicular emission and its phytomonitoring along two roads (Pindi Bhatian to Kala Shah Kaku and Lahore to Gujranwala)	2018	UAF
13.	Dr. Azka Javaid 2008-ag-263 Botany	Development and biochemical changes in maize embryonic tissues under cadmium (Cd) toxicity and mitigation strategies to circumvent Cd damage	2018	UAF
2019				
14.	Dr. Farah Gul		2019	UAF
15.	Dr. Shazia Batool 2014-ag-824 Botany	Comparative effectiveness of plant growth regulators in etiolation/de-etiolation response of maize: elucidation of possible mechanism	2019	UAF
2020				
16.	Dr. Amina Ramzan 2010-ag-73 Botany	Exploring quinoa's phytoremediation ability in cadmium contaminate soil	2020	UAF
2022				
17.	Sulman Siddique 2010-ag-3513 ISES	Exploring potential of seed endophytic bacteria for enhancing drought stress resilience in maize (*Zea mays* L.)	2022	UAF
2023				
18.	Dr. Faakeha Islam 2013-ag-1744 Botany	Distribution, ecology and adaptive components in *Olea europaea* subsp. *Cuspidata* and *Senegalia modesta* from the Punjab, Pakistan	2023	UAF
2024				
19.	Mehwish Noor 2013-ag-1790 Botany	Zinc variability evaluation in wheat (*Triticum aestivum* L.) germplasm associated with root system architecture	2024	UAF
20.	Dr. Abdul Qadeer 2009-ag-2437 ISES	Fertilizer use efficiency of NP-based formulated fertilizers in maize (*Zea mays* L.) applied through soil, fertigation and foliar	2024	UAF
21.	Zia Ur Rehman	Estimation and improvement of carbon sequestration	2024	UAF

	Farooqi 2010-ag-2600 ISES	potential in marginally salt-affected soil using organic amendments		
22.	Nukshab Zeeshan 2010-ag-3462 ISES	Atmospheric pollution and its risk to soil and plant quality and human health	2024	UAF
23.	Farhat Naz 2014-ag-2473 Botany	Alleviation of satl stress by exogenous application of proline in *Linum usitatissimum* L. (Flaz)	2024	UAF