

CURRICULUM VITAE

PERSONAL

Name **Dr. Fiaz Ahmad**
 Fathers' Name Nisar-Un-Nabi
 Date of Birth 20th January 1964
 Postal Address Physiology/Chemistry Section,
 Central Cotton Research Institute
 Old Shujabad Road, P.O. Box 572, Multan, Pakistan
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ACADEMIC

Certificate/ Degree	Year	Division/ CGPA	Institution
PhD Title: Phosphate and micronutrient (Fe, Mn, Cu & Zn) behavior under flooded and aerated soil conditions	1996	--	University of North Wales, Bangor, UK
MSc Hons. Agri. Title: Yield of Basmati-370 as affected by N-fertilizer levels and plant spacings)	1990	3.54/4.00	University of Agriculture, Faisalabad
BSc Hons. Agri. Title: Characterization of salt affected soils	1988	3.35/4.00	University of Agriculture, Faisalabad, Pakistan
FSc (Pre-Medical)	1981	1 st	Govt. Degree College Burewala, Distt. Vehari
Matric	1979	1 st	Govt. High School Gaggoo, Distt. Vehari

PROFESSIONAL EXPERIENCE: more than 23 years

Period	Position	Department/Organization	Responsibilities
21 January 2009 to present	Senior Scientific Officer / Head	Physiology / Chemistry Section, Central Cotton Research Institute, Multan	<ul style="list-style-type: none"> • Being in-charge of the section plan and finalize year-to-year research program of the section and its execution with the coordination of associate scientists/staff. • Stress Physiology (Heat & drought tolerance in cotton) such as physiological aspects like RWC, LWP, Gas exchange, fruit production pattern etc. • Cotton Plant Nutrition: Macro-(NPK) & Micro- nutrients (B & Zn) • Seed physiology (impacts of abiotic stresses on seed health, germination, vigor, oil content)

			<ul style="list-style-type: none"> and FFAs) • Fertilizer application techniques to improve nutrient-use-efficiency • Biosafety and risk assessment of Bt cotton • Rehabilitation of soil resources (Soil health, reduced tillage, beneficial microbes) • Soil and plant analysis in the laboratory using Atomic Absorption Spectrophotometer, UV-VIS Spectrophotometer, Flame Photometer etc. • Established nutrient deficiency symptoms of <u>N,P, K, B & Zn</u> in cotton plant using sand culture technique) • Data compilation, statistical analyses and report writing
02 Jan. 2001 to 20 Jan. 2009	Scientific Officer	Physiology/Chemistry Section, Central Cotton Research Institute, Multan	<ul style="list-style-type: none"> • Planning and execution of research trials on cotton nutrition, and water deficit stress in cotton
03 May 1997 to 01.01.2001	Reclamation Supervisor	Directorate of Land Reclamation Punjab, Lahore	<ul style="list-style-type: none"> • Monitoring salinity assessment in irrigated areas of Punjab through extension soil surveys, soil and water sampling. • Groundwater monitoring in the salt affected areas • Rehabilitation of salt affected soils using chemical amendments
July 1997 to Jan. 1997		MOP, Research and Development Project, NARC, Islamabad	<ul style="list-style-type: none"> • Field experimentation on the comparative evaluation of of Muriate of Potash (MOP) with Sulphate of Potash (SOP) • Planning the research experiments of MOP Project for farmers' fields. • Compilation of research reports of MOP project.

ADDITIONAL ASSIGNMENTS:

- ❖ **Secretary ICRA** (International Cotton Researchers Association, Oct, 2017 – Sep 2022).
- ❖ **Provincial Coordinator** (Punjab): Better Cotton Project of PCCC (2020-2022)
- ❖ **Member, Technical Advisory Committee** of CCRI, Multan (Since May, 2019)
- ❖ **Member Editorial Board, Cottongrower**, CCRI, Multan (Since January, 2018)

REVIEWER:

- ❖ Archives of Agronomy and Soil Science
- ❖ Ecotoxicology and Environmental Safety
- ❖ Synopsis of PhD students of Bahauddin Zakaryia University Multan, Pakistan.
- ❖ Journal of Research (Science), Bahauddin Zakaryia University Multan, Pakistan.
- ❖ The Pakistan Cottons, Pakistan Central Cotton Committee, Karachi.
- ❖ Review of HEC-funded research projects on different aspects of cotton crop

AWARDS AND HONORS

1. Merit Scholarship for MSc. Hons Agri. by Ministry of Education, Government of Pakistan.
2. Merit Scholarship for PhD studies from UK by Ministry of Education, Government of Pakistan

RESEARCH PROJECTS:

Duration	Amount	Title	Funding agency	Status	Role
4 year (2019-22)	300 million	Better Cotton Initiative for sustainable Cotton Production in Pakistan	Public Sector Development Program, Government of Pakistan	Ongoing	Provincial Coordinator, Punjab
3 years (2014-17)	3.838 Million rupees	Nutrient Management for Sustaining Cotton Productivity and Soil Health by Conjoint Use of Organic and Inorganic Fertilizers	ALP, PARC	Completed	Principal Investigator
2012	15000 US \$	Effect of Bt cotton on chemistry, microbial community structure and enzymatic activity in the rhizosphere soil	USAID	Completed	Lead Investigator

RESEARCH SUPERVISION:

Co-supervisor of following PhD students enrolled at Bahaudin Zakariya University, Multan and others:

PhD degree awarded:

- i). Mr. Sana Ullah Yasin, ISES, University of Agriculture Faisalabad (2016)
- ii) Mr. Mohammad Naveed Afzal, University College of Agriculture, Bahauddin Zakariya University Multan (2011)
- iii) Mr. Jam Niaz Ahmad, University College of Agriculture, Bahauddin Zakariya University Multan (2011)

Ongoing:

- i) Mr. Muhammad Ibrahim, Biochemistry Department, BZ University, Multan
- ii) Ms. Sumbal Ayaz, Biochemistry Department, BZ University, Multan
- iii) Mr. Najam Abbas, Environmental Sciences, GC University Faisalabad
- iv) Mr. Muhammad Naeem Akhtar, Department of Soil Science, MNSUA, Multan

Collaborative studies:

- ❖ **FAO-NFDC-CCRI** Collaborated project on “Residual Effect of P on Succeeding Crop” (3 Year field trials on cotton-wheat cropping pattern. Study completed in 2006).
- ❖ Fertilizer trials on cotton crop with the collaboration of Engro Chemicals, WWF and Pak-Arab Fertilizers Limited etc.

PROFESSIONAL AFFILIATION

- ❖ Soil Science Society of Pakistan
- ❖ Pak Kisan Technical Advisory Forum
- ❖ International Centre for Biosaline Agriculture (ICBA)

ANALYTICAL EXPERTISE

i) Water Analysis

- * Carbonates & bicarbonates by Titration method
- * Sulfate by Turbidimetric method
- * Chlorine by DPD (N-diethyl-p-phenylene-diamine) indicator
- * Calcium, magnesium, sodium & potassium by Flame photometer/Atomic absorption spectrophotometer
- * pH by pH meter
- * RSC by calculation after analysis

ii) Soil Analysis

Physical

- * Particle size distribution, Textural class, Soil moisture content etc.

Chemical

- * EC, pH, Calcium carbonate, Organic matter, Cation Exchange Capacity, Gypsum requirement
- * **Nitrogen**-Kjeldahl Method
- * **Nitrate Nitrogen**-Spectrophotometric method (Chromotropic acid)
- * **Extractable Phosphorus**- Sodium bicarbonate/AB-DTPA extraction and quantification by Spectrophotometer
- * **Total Phosphorus**-Wet digestion followed by color development with ammonium molybdate and ammonium metavanadate
- * **Organic Phosphorus**-Ignition Method
- * **Potassium**-Extractable, Soluble, Exchangeable
- * **Sodium**-soluble & extractable
- * **Calcium and Magnesium**- Soluble
- * **Carbonate and bicarbonate**-soil saturation extract
- * **Chloride**-soil saturation extract by silver nitrate titration
- * **Sulfate**-Turbidimetric method/Precipitation method
- * **Boron**-Hot water soluble (Azomethine-H solution)
- * **Micronutrients** (Iron, Zinc, Manganese and Copper)-DTPA or AB-DTPA extraction & quantification by Atomic Absorption Spectrophotometry

iii) Plant Analysis

- * **Nitrogen**-Kjeldahl Method
- * **Nitrate Nitrogen**-Wet digestion
- * **Total Nitrogen**-Digestion in sulfuric-salicylic acid mixture
- * **Total Phosphorus, Potassium, Calcium, Magnesium, Sodium and other**
- * **Micronutrients**-Wet digestion method

DEMONSTRATION/ADVISORY STUDIES

Demonstration trials on Government research stations and farmer's fields:

- * Use of Nano Particles in cotton crop
- * Fertilizer's dose optimization
- * Application methods (soil, foliar)
- * Appropriate stage for foliar fertilization
- * Fertilizer management under water stress conditions
- * Varietal variations in fertilizer use
- * Technical guidance to farming community

TECHNOLOGY TRANSFER: Regular activity as a service to community

- * Radio talks
- * TV talks
- * Seminars
- * Training of different stakeholders (extension officers from Punjab, KP and Balochistan, technical officers of private companies, farmers and students)
- * Video message on cotton irrigation and nutrition management during the crop season

COMPUTER SKILLS:

- ❖ Microsoft Office Professional (Word, Excel, Power Point),
- ❖ Statistix
- ❖ Minitab
- ❖ Mendeley
- ❖ Wordpress

PUBLICATIONS:

i) Research Papers (International)

1. Riaz Marral MW, Khan MB, **Ahmad F**, Farooq S, Hussain M (2020) The influence of transgenic (Bt) and non-transgenic (non-Bt) cotton mulches on weed dynamics, soil properties and productivity of different winter crops. PLoS ONE 15(9): e0238716. <https://doi.org/10.1371/journal.pone.0238716>
2. Muhammad Asif Shehzad, Fahim Nawaz, Fiaz Ahmad, Naveed Ahmad and Shahid Masood. 2020. Protective effect of potassium and chitosan supply on growth, physiological processes and antioxidative machinery in sunflower (*Helianthus annuus* L.) under drought stress. Ecotoxicology and Environmental Safety: 187:109841
3. Yasin, S., Asghar, H.N., **Ahmad, F.** and Waraich, E. 2016. Influence of Bt cotton on soil microbiological and biochemical attributes. Plant Production Science:1-10 (<http://dx.doi.org/10.1080/1343943X.2016.1185637>)
4. N. Ahmed, M. Abid, A. Rashid, R. Abou-Shanab and **F. Ahmad**. 2014. Influence of Boron Nutrition on Membrane Leakage, Chlorophyll Content and Gas Exchange Characteristics in Cotton (*Gossypium hirsutum* L.). Journal of Plant Nutrition, 37:14, 2302-2315, DOI:10.1080/01904167.2014.912325
5. Muhammad Babar, Wajad Nazeer, Iqra Aslam, Raheela Waheed, Ammarah Hasnain, Muhammad Naeem, **Fiaz Ahmad**, Muhammad Ijaz, Baoliang Zhou. 2014. Correlation, Genetic Diversity and QTL Mapping for drought Tolerance in Cotton (*Gossypium hirsutum* L.). Bothalia Journal, 44:183-199

6. **Fiaz Ahmad**, Shabab Ud Din, Asia Perveen and Mohammad Naveed Afzal. 2013. Investigating critical growth stage of cotton subject to water deficit stress. *Iranian Journal of Plant Physiology* 4: 873-880.
7. **Fiaz Ahmad**, Shabab-Ud-Din, Niaz Ahmad and Rafiq Islam (2013): Phosphorus–microbes interaction on growth, yield and phosphorus-use efficiency of irrigated cotton, *Archives of Agronomy and Soil Science*, 59:341-349.
8. Niaz Ahmed, Muhammad Abid, **Fiaz Ahmad**, Qaisar Javaid, Muhammad Aman Ullah and Muhammad Arif Ali. 2011. Impact of Boron Fertilization on Dry Matter Production and Mineral Constitution of Irrigated Cotton. *Pak. J. Botany*, 43:2903-2910.
9. Hakoomat Ali, Mohammad Naveed Afzal, **Fiaz Ahmad**, Shakeel Ahmad, Maqbool Akhtar and Raheel Atif. 2011. Effect of Sowing Dates, Plant Spacing and Nitrogen Application on Growth and Productivity on Cotton Crop. *Intl. J Sci. & Eng. Res.* 2:1-6.
10. **Fiaz Ahmad**, Shabab-ud-Din and Rehmat Ali. 2011. Identifying physiological traits of cotton genotypes to cope with water shortage problems. Published online by International Cotton Advisory Committee. <http://www.icac.org/tis/regionalnetworks/asiannetwork/meeting5/documents/papers/FiazA.pdf>
11. Niaz Ahmad, **Fiaz Ahmad**, Muhammad Abid and M. Aman Ullah. 2009. Impact of zinc fertilization on gas exchange characteristics and water use efficiency of cotton crop under arid environment. *Pak. J. Bot.* 41:2189-2197.
12. Niaz Ahmad, Muhammad Abid and **Fiaz Ahmad**. 2008. Boron toxicity in irrigated cotton (*Gossypium hirsutum* L.). *Pak. J. Bot.* 40:2443-2452.

ii) Research Papers (National)

1. Asia Perveen, **Fiaz Ahmad** and Noor Muhammad. 2017. Adaptability testing of transgenic cotton genotypes to high temperature stress conditions. *The Pakistan Cottons*, 57:50-57.
2. Muhammad Akbar, Farzana Ashraf, Syed Bilal Hussain, **Fiaz Ahmad** and Tassawer Hussain Malik. 2017. Assessment of drought tolerant Upland cotton genotypes based on seedling traits at different moisture level. *The Pakistan Cottons*, 57:76-89.
3. Shabab-ud-Din, **Fiaz Ahmad**, Asia Perveen and Mehwish Manan. 2014. Effect of exogenous application of boron and zinc with or without added urea on the yield and nutrient assimilation of cotton. *The Pakistan Cottons*, 56 (1-4):24-34.
4. Shabab-ud-Din, **Fiaz Ahmad**, M.N. Akhtar and Mehwish Manan. 2014. Phosphorus application strategies to improve cotton productivity under arid climatic conditions. *The Pakistan Cottons*, 56(1-4):14-23.
5. Shabab-ud-Din, **Fiaz Ahmad** and Muhammad Naeem Akhtar. 2009. Interactive effects of elemental sulphur (S) and farmyard manure (FYM) incorporation on the production of seed cotton, oil and protein yields under arid environment. *The Pakistan Cottons*, 53(3 & 4):9-14.
6. Shabab-ud-Din, **Fiaz Ahmad**, Muhammad Naeem Akhtar and Ghulam Murtaza. 2008. Comparative efficacy of foliar feeding versus soil application of boron and zinc fertilizers on gas exchange characteristics for economic seed cotton production. *J. res. Sci.* 19(3 & 4): 97-105.
7. **Ahmad, F.**, Shabab-ud-Din and M.I. Makhdum. 2007. Role of Phosphobacterium in soil-P availability and lint yield of cotton. *The Pakistan Cottons*, 51(1&2):15-24.
8. Makhdum, M.I., and **F. Ahmad**. 2006. Effects of applied potassium chloride and potassium sulphate on their distribution in a silt loam soil under field-grown cotton (*Gossypium hirsutum* L.). *The Pakistan Cottons*, 50 (3 & 4):43-55.
9. Makhdum, M.I., M.I. Gill, Shabab-ud-Din and **F. Ahmad**. 2006. Effect of exogenous application of organic fertilizer “Riverm” at various physiological stages of growth on vegetative and reproductive development of cotton. *The Pakistan Cottons*, 50(1-2):67-74.
10. Makhdum, M.I., Shabab-ud-Din and **F. Ahmad**. 2005. Influence of Exogenous Glycine Betaine

- on Water Relation in Cotton (*Gossypium hirsutum* L.). J. Sci. Tech. 29(2):1-4.
11. Makhdum, M.I., Shabab-ud-Din and **F. Ahmad**. 2005. Response of organic foliar fertilizer Riverm to vegetative growth and seed cotton yield of cotton crop. The Pakistan Cottons, 49 (1&2):21-27.
 12. Makhdum, M.I., Shabab-ud-Din and **F. Ahmad** and K.U. Khan, 2004. Effect of Uni-Zinc Chelate fertilizer application on vegetative growth and seed cotton yield of cotton crop. The Pak. Cottons, 48 (3 & 4):43-48.
 13. Makhdum, M.I.; M.N.A. Malik, Shabab-ud-Din, **F. Ahmad** and F.I. Chaudhry 2002. Influence of Flower Bud Removal on Growth, Dry Matter Production and Partitioning in Cotton (*Gossypium hirsutum* L.) J. res. Sci., Vol. 13 (2):129-134.
 14. Makhdum, M.I.; M.N.A. Malik, Shabab-ud-Din, **F. Ahmad** and F.I. Chaudhry 2002. Physiological Response of Cotton to Methanol Foliar Application J. res. Sci., Vol. 13 (1):37-43.
 15. Makhdum, M.I.; Shabab-ud-Din, **F. Ahmad** and F.I. Chaudhry. 2002. Zinc and Boron Requirement for Cotton Grown in a Calcaric Cambisol. Balochistan J. Agri. Sci. Vol. 3(2):11-14.
 16. Makhdum, M.I.; Shabab-ud-Din, F.I. Chaudhry and **F. Ahmad**. 2002. Using a Chlorophyll Meter to Improve Nitrogen Management in Cotton (*Gossypium hirsutum* L.) *Pak. J. Soil Sci. Vol. 21:60-67. (*Presently Soil and Environment).
 17. Makhdum, M.I.; M.N.A. Malik; **F. Ahmad**, F.I. Chaudhry and Shabab-ud-Din. 2001. Investigation on the physical parameters of the environment and their impact on cotton crop production in the Southern Punjab, Pakistan. J. res. Sci., 12(2): 147-154.
 18. **Ahmad, F.** and W.I. Kelso. 2001. Role of pyrophosphate and organic acids in orthophosphate sorption by calcium carbonate. Pak. J. Soil Sci* 20:61-69.
 19. **Ahmad, F.** and W.I. Kelso. 2001. Role of pyrophosphate and organic acids in orthophosphate sorption by varied nature soils. Pak. J. Soil Sci*. 20:55-60
 20. **Ahmad, F.** and W.I. Kelso. 2001. Pyrophosphate as a source of phosphorus: Hydrolysis under different conditions. J. res. Sci., 12 (2):130-139.
 21. **Ahmad, F.** and W.I. Kelso. 1997. Role of Pyrophosphate and organic acids in inhibiting Phosphorus and Zinc sorption. Poster presentation in Symp. on Plant Nutrient Management for Sustainable Agricultural Growth. NFDC, Islamabad, Dec. 8-10, 1997, pp: 333-339.

BOOK CHAPTERS

1. Niaz Ahmad, Muhammad Arif Ali, Subhan Danish, Usman Khalid Chaudhry, Sajjad Hussain, Waseem Hassan, **Fiaz Ahmad** and Nawab Ali. 2020. Role of Macro Nutrients in Cotton Production. In S. Ahmad, M. Hasanuzzaman (eds.), *Cotton Production and Uses*, Springer Nature Singapore Pte Ltd., pp: 81–104.
2. Niaz Ahmad, Muhammad Arif Ali, Sajjad Hussain, Waseem Hassan, **Fiaz Ahmad** and Subhan Danish. 2020. Essential Micronutrients for Cotton Production. In S. Ahmad, M. Hasanuzzaman (eds.), *Cotton Production and Uses*, Springer Nature Singapore Pte Ltd., pp: 105 – 117.
3. Niaz Ahmed, Usman Khalid Chaudhry, Muhammad Arif Ali, **Fiaz Ahmad**, Muhammad Sarfraz and Sajjad Hussain. 2020. Salinity tolerance in cotton, In S. Ahmad, M. Hasanuzzaman (eds.), “*Cotton Production and Uses*”, Springer Nature Singapore Pte Ltd., pp:367– 391.
4. **Fiaz Ahmad**, Asia Perveen, Noor Muhammad, Muhammad Arif Ali, Mohammad Naeem Akhtar, Khurram Shahzad, Subhan Danish and Niaz Ahmed. 2020. Heat Stress in Cotton: Responses and adaptive mechanisms In S. Ahmad, M. Hasanuzzaman (eds.), *Cotton Production and Uses*, Springer Nature Singapore Pte Ltd., pp:393 – 428.
5. Muhammad Ibrahim, **Fiaz Ahmad**, Bushra Yaqub, Ayesha Ramzan, Ayesha Imran, Muhammad Afzaal, Safdar Ali Mirza, Iqra Mazhar, Muhammad Younus, Qaisar Akram, Muhammad Sulman Ali Taseer, Ali Ahmad, and Sarfraz Ahmed. 2020. Current trends of antimicrobials used in food animals and aquaculture. In M. Z. Hashmi (ed.), “*Antibiotics and Antimicrobial Resistance Genes in the Environment*”, Vol. I, Elsevier Inc. pp:39 – 69.

6. Sarfraz Ahmed, Muhammad Ibrahim, **Fiaz Ahmad**, Hafsa Anwar Rana, Tazeen Rao, Wajiha Anwar, Muhammad Younus, Waqas Ahmad, Shahid Hussain Farooqi, Asma Aftab, Munawar Hussain, Muhammad Khalid, and Ghulam Mustafa Kamal. 2020. Microbial risk assessment and antimicrobial resistance. In *M. Z. Hashmi (ed.), "Antibiotics and Antimicrobial Resistance Genes in the Environment"*, Vol. I, Elsevier Inc. pp:313 – 330.

PARTICIPATION IN SEMINARS/CONFERENCES

International

1. Attended the International Conference on "Smart potassium nutrition management in crops under changing climate" held at MNSUA, Multan, Pakistan on 03 March, 2020 and presented a talk on "Importance and use of potassium in cotton production".
2. Attended the 2nd Sino Pak International Conference on "Innovations in Cotton Breeding and Biotechnology" held at MNSUA, Multan, Pakistan from 26-27 November, 2018 and presented a paper entitled "Quantifying stress tolerance in cotton grown under normal irrigation and water deficit conditions".
3. Attended international conference on Climate Smart Agriculture: The way forward for 21st Century held at MNSUA Multan, Pakistan from 08-09 October, 2018 and presented a paper entitled "An assessment of morphological and physiological indicators of thermotolerance in field grown cotton".
4. Attended the 1st. Sino Pak International Conference on "Innovations in Cotton Breeding and Biotechnology" held at MNSUA, Multan, Pakistan from 22-24 November, 2017 and presented a paper entitled "Heat tolerance in cotton: Physiological and morphological aspects".
5. Organized and attended the 6th International Conference of Pakistan Phytopathological Society "Plant Health for Sustainable Agriculture" held at jointly BZU, Multan and CCRI, Multan from November 20-22, 2017.
6. Attended the 75th Plenary Meeting of International Cotton Advisory Committee under the title "Emerging dynamics in cotton: Enhancing sustainability in cotton value chain" held at Serena Islamabad from 30th October to 04th November, 2016.
7. Attended international "One-day symposium on the Public-Private Partnership to Manage Soil Fertility in Pakistan" held at Islamabad, 2015.
8. Attended "2nd Annual South Asia Biosafety Conference held from September 15-16, 2014 Colombo, Sri Lanka and presented research work as poster on "Nutrient dynamics, microbial and enzymatic activities as affected by Bt and non-Bt cotton rhizospheres".
9. Attended the International Symposium on the "Use of Potassium in Pakistan" held at Serena Hotel, Faisalabad, Pakistan from 06-07 November, 2012 and presented a paper entitled "Alleviating water deficit stress in cotton by potassium fertilizer management".
10. Attended the "First International Conference on Science, Industry and Trade of Cotton" held from 02-04 October, 2012 in Gorgan, Iran and presented a research paper "Nutrient management in cotton under water stress environments".
11. Attended the "5th Meeting of the Asian Cotton Research and Development Network held at Lahore from 23-25, Feb. 2011 and presented a paper "Identifying physiological traits of cotton genotypes to cope with water shortage problems".
12. Attended the "International Conference on "Recent Techniques in Abating Soil and Water Salinity" held at Ayub Agricultural Research Institute, Faisalabad, Pakistan on 22-24 April 2008.
13. Attended the 9th International Congress of Soil Science held at NIAB, Faisalabad on 18-20th March, 2002 and presented a research paper entitled "Role of Phosphate Solubilising Microorganisms on Phosphorus Use Efficiency in Cotton".

14. Attended the 6th International Congress of Soil Science on "Soil Care for Environmental Protection" held at Avari Towers, Lahore on December 2-4, 1996.

National

1. National seminar on "Cotton Leaf Curl Disease" held at CCRI, Multan on 24 February, 2012.
2. Attended the National Seminar on Cotton at NIAB, Faisalabad, on 2-3 May 2007 and presented at paper entitled "Interactive effects of nitrogen and potassium fertilizers in relation to CLCuV disease and seed cotton production".
3. Attended the Symposium on Plant Nutrient Management for Sustainable Agricultural Growth at National Fertilizer Development Centre, Islamabad from 8-10th December 1997 and presented a research paper entitled "Role of Pyrophosphate and organic acids in inhibiting Phosphorus and Zinc sorption".

TRAININGS OBTAINED

1. International Training by ThermoFisher Scientific on Chromeleon and HPLC Customer Training at APTCoE in Bangkok, Thailand from December 06-08, 2011.
2. International training course on New Varieties and Technologies of Cotton for Developing Countries from 01.09.2010 to 26.10.2010 in Beijing, China, organized by Ministry of Agriculture (in association with ITC, Switzerland), Peoples Republic of China.
3. Training Workshop on Real Time PCR from June 08-11, 2010 organized by Department of Biochemistry, PMAS-Arid Agriculture University, Rawalpindi.
4. Post-Graduate Training on Nuclear and Other Advanced Techniques in Agricultural and Biological Research held at Nuclear Institute for Agriculture and Biology, Faisalabad, during December 4-14, 2007.
5. Two days training on Photosynthesis System (CID-340) by Dr. Shafqat Farooq, PSO, NIAB, Faisalabad during 26-27 April 2005.
6. 5-days Operational / Troubleshooting Training on Gas Chromatography (GC) held at Pakistan Council of Scientific and Industrial Research Complex, Lahore during June 10-14, 2002.
7. 5-days Operational / Troubleshooting Training on High Performance Liquid Chromatography (HPLC) held at Pakistan Council of Scientific and Industrial Research Complex, Lahore during April 9-13, 2002.
8. 5-days Operational / Troubleshooting Training on Atomic Absorption Spectroscopy held at Pakistan Council of Scientific and Industrial Research Complex, Lahore during February 4-8, 2002.

TRAINING TO UNDER / POST GRADUATE STUDENTS

Training to post-graduate and under-graduate internee students from BZU, Multan, IUB, Bahawalpur and UA, Faisalabad is being provided (regular activity) during cotton seasons since 2003. Areas covered were soil analysis, pot and field experimentation, data collection on physiological aspects, cotton nutrition management, hydroponics screening for K-efficiency, virus infestation, irrigation management etc.

PAPERS PRESENTED/PROCEEDINGS IN CONFERENCES/SYMPOSIUMS

1. **Fiaz Ahmad**, Noor Muhammad, Asia Perveen, Muhammad Azam and Zahid Mehmood. 2020. Role and efficient method of magnesium application in cotton growth and productivity. In proceedings :18th International Congress of Soil Science" held from February 11-13 at Sindh Agricultural University, Tandojam, Pakistan, pp:115

2. Muqarrab Ali, Muhammad Nazim, **Fiaz Ahmad**, Fahim Nawaz, Muhammad Amin and Qurat-Ul-Ain Sadiq. 2019. Mitigating drought stress in cotton through regulated exogenous application of kaolin and Jasmonic acid under water deficit condition. In proceedings “3rd Sino-Pak International Conference on Innovations in Cotton Breeding and Biotechnology” held from September 04-06 at Changji, China, pp:26-27.
3. Hafiz Shahzad Ahmad, Muhammad Imran, Tanveer Ul Haq, Rao Muhammad Ikram and **Fiaz Ahmad**. 2018. Improving crop water productivity in cotton through regulated deficit irrigation in arid climate. 1st International Conference on “Soil and Crop Health in Changing Climate” November 28-29, 2018, MNSUA, Multan, pp:14-15.
4. **Fiaz Ahmad**, Asia Perveen, Noor Muhammad and Zahid Mehmood. 2018. Quantifying stress tolerance in cotton grown under normal irrigation and water deficit conditions. In proceeding of the 2nd Sino Pak International Conference on “Innovations in Cotton Breeding and Biotechnology” held at MNSUA, Multan, Pakistan from 26-27 November, 2018, p13.
5. Asia Perveen, **Fiaz Ahmad**, Noor Muhammad and Zahid Mehmood. 2018. An assessment of morphological and physiological indicators of thermotolerance in field grown cotton. In proceedings of international conference on “Climate Smart Agriculture: The way forward for 21st Century” held at MNSUA, Multan, Pakistan from 08-09 October, 2018, p27.
6. Muhammad Naeem Akhtar, Tanveer-ul-Haq, **Fiaz Ahmad**, Wazir Ahmed, Abdul Ghaffar and Muhammad Imran. 2018. Exploring genotypic variation in cotton (*Gossypium hirsutum* L.) for K use efficiency in hydroponics. In proceedings “2nd Sino-Pak International Conference on Innovations in Cotton Breeding and Biotechnology” held at MNSUA, Multan from 26-27 November, 2018, p47
7. Noor Muhammad, **Fiaz Ahmad**, Ali Raza Khan, Khurram Shahzad, Naeem Akhtar, Asia Parveen and Imran Haider Shamsi. 2018. Does there exist a natural detoxification mechanism between aluminum and manganese in acidic soils?, p47. In proc., 1st International Conference on “Soil and Crop Health in Changing Climate” held at MNSUA, from 28-29 November, 2018.
8. Muhammad Naeem Akhtar, Tanveer-ul-Haq, **Fiaz Ahmad**, Wazir Ahmed, Abdul Ghaffar and Muhammad Imran. 2018. Exploring physiological diversity in cotton cultivars with respect to applied potassium under water deficit stress, p20. In proc., 1st International Conference on “Soil and Crop Health in Changing Climate” held at MNSUA, from 28-29 November, 2018.
9. Asia Perveen and **Fiaz Ahmad**. 2017. Heat tolerance in cotton: Physiological and morphological aspects. In proceedings of 1st Sino Pak International Conference on “Innovations in Cotton Breeding and Biotechnology” held at MNSUA, Multan, Pakistan from 22-24 November, 2017, p33.
10. **Fiaz Ahmad**, Hafiz Naeem Asghar, Sanaullah Yasin, Asia Perveen, Zahir Ahmad Zahir and Rafiq Islam. 2014. Nutrient dynamics, microbial and enzymatic activity as affected by Bt and non-Bt cotton rhizospheres. Proceeding of the 2nd International South Asia Biosafety Conference held in Colombo, Sri Lanka from 15-16 September, 2014, p36.
11. **Fiaz Ahmad**, Dilbaugh Muhammad, Shabab-Ud-Din and Muhammad Naveed Afzal. 2012. Alleviating water deficit stress in cotton by potassium fertilizer management”. International Symposium on the “Use of Potassium in Pakistan” held at Serena Hotel, Faisalabad, Pakistan from 06-07 November.
12. Ghulam Hussain Mirbahar, **Fiaz Ahmad** and Shabab-Ud-Din. 2012. “Nutrient management in cotton under water stress environments. First International Conference on Science, Industry and Trade of Cotton” held from 02-04 October, 2012 in Gorgan, Iran.
13. **Fiaz Ahmad**, Shabab-ud-Din and A. Perveen. 2012. Qualitative and quantitative impacts of Cotton Leaf Curl Virus on cotton (*Gossypium hirsutum* L.). Proceeding of National Seminar on Cotton held on 24th February, 2012 at Central Cotton Research Institute, Multan, Pakistan.

14. **Fiaz Ahmad**, Shabab-ud-Din and Rehmat Ali. 2011. "Identifying physiological traits of cotton genotypes to cope with water shortage problems" 5th Meeting of the Asian Cotton Research and Development Network held from 23-25, Feb. Pearl Continental Hotel, Lahore, Pakistan.
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