

ABID ALI

Short Biography:

I hold a doctoral degree in agronomy by following “remote sensing and precision agriculture technologies” at Department of Agricultural and Food Sciences-DISTAL, University of Bologna, Italy. I have experienced in retrieving satellite remote imagery and meteo data from multi-source online platforms; satellite image processing etc; geostatistics analyst using remote, crop yields and soil data; handling of big GIS dataset; delineating field spatiotemporal heterogeneity using multi-variables influencing crop yields; development of site-specific zones for crop management practices; GIS based software’s (mainly ArcGIS, QGIS, MZA and ESAP); ECa survey directed to soil sampling (ESAP software); and having technical skills on machine learning software (MATLAB)-specially artificial neural network modeling. Currently collaborating in national, European, and international research universities/institutes with main focus for enhancing agricultural crop yields and giving lectures to graduate students focusing GIS subject. Author of 12 research articles; topic editor and reviewer board member of Remote Sensing and Land, MDPI; raised special issue in digital agriculture as a corresponding leader for Remote Sensing-MDPI; contributing as a potential reviewer in high impact factor journals of national and international level.

Academic Qualification:

<i>Qualification</i>	<i>Board/University</i>	<i>Passing Year</i>
Doctor of Philosophy (PhD) in Agriculture Agronomy	University of Bologna, Italy	2020
M. Sc. (Hons.) Agriculture (Agronomy)	Arid Agriculture University Rawalpindi, Pakistan	2014
B. Sc. (Hons.) Agriculture (Agronomy)	Arid Agriculture University Rawalpindi, Pakistan	2011
F. Sc. (Pre-Engineering)	BISE Gujranwala, Pakistan	2007
Matric (Science)	BISE Gujranwala, Pakistan	2004

INTERNSHIP:

- I completed 3 months scientific internship (March 5 to June 5, 2018) as a **PhD visiting scholar** at United States Department of Agriculture (USDA), U.S. Salinity Laboratory, Riverside, CA, United States of America. During this time I received the instruction from Senior Scientist ‘Dr.

Dennis Corwin', Research Soil and Environmental Sciences and Research Agronomist 'Dr. Elia Scudiero', covering a wide range of topics relevant to the field scale salinity assessment and delineation of site-specific management units used in precision agricultural practices. These topics are listed below:

1. Types of proximal sensors and what they measure
2. Conceptual approach to field-scale mapping of salinity, water content, texture, organic matter, bulk density using ECa-directed soil sampling
3. Protocols and guidelines for ECa-directed soil sampling
4. Soil sampling design strategies
 - a. Model-based sampling (response surface sampling design)
 - b. Design-based sampling (e.g., stratified random sampling, unsupervised classification, etc.)
5. Conducting an ECa-directed soil sampling survey for field-scale assessment of soil salinity in the root zone and characterization of spatial variability
 - a. Operation and calibration of the Geonics dual-dipole EM38 electromagnetic induction conductivity meter
 - b. Coupling EM38 to GPS
 - c. Conducting a EM38 survey
 - d. Downloading data into ESAP software
 - e. Basic operation of ESAP software for site selection based on geospatial ECa data
 - f. Mapping of ECa with ArcGIS
 - g. Calibration of ECa to salinity (ECe) or other correlated soil properties (e.g., water content, clay content, organic matter content, pH, bulk density)
 - h. Use of ArcGIS for mapping spatial variability of soil properties from 'hard' and 'soft' data
6. Delineation of site-specific management units (SSMUs) with ECa-directed soil sampling
7. Statistical and geostatistical tools for spatial data analysis
 - a. Spatial data preprocessing (e.g., removal of outliers and inliers)
 - b. Visualization of spatial data in ArcMap
 - c. Data exploratory analyses (e.g., histogram, subdivision by percentile classes)
 - d. Spatial trend analyses
 - e. Understanding semivariograms and cross-correlograms (theory and implementation)
 - f. Using kriging to interpolate spatial data
 - g. Cross validation (theory and implementation)
 - h. Visualization of scatterplots for big datasets with the hexbin library in R

- i. Calculating spatial and temporal trends in multi-temporal spatial data (e.g., yield data, remote sensing vegetation indices)
- j. Understanding spatial scales: upscaling and downscaling spatial information (theory)
- k. Fuzzy clustering of spatial data (theory and implementation)

Note: I received this instruction through attending short courses on field-scale salinity assessment and site specific management, hands-on use of equipment, informal meetings, and a field trip to California's San Joaquin Valley

- Attended 03 Months Internship in National Agriculture Research Centre (NARC), Islamabad on the topic of **Effects of Supplemental Irrigation on Wheat Yield** from 14 March, 2011 to 14 June, 2011 at Wheat Program, **Crop Sciences Institute (CSI)** under the co-supervision of Mr. Haider Abbas (Scientific Officer) and Dr. Imtiaz Hussain (Principle Scientific Officer).

Work Experience:

1. PhD activities

- Precision Agriculture

Title. Soil and Environmental Factors Drive Spatiotemporal Variability of Yields in a Crop-Rotation Field under Uniform Management

- a. Development of classified management zones based on multi-year standardized spatio-temporal variability of crop yields using geostatistical analysis with best fit semivariogram models.
- b. Apparent soil electrical conductivity (ECa) survey of soil by using mobile based electrical resistivity (ER)
- c. Application of model based response surface (ESAP software) sampling technique to locate the spatial variability within field based on soil ECa.
- d. Using of mobile based GPS Stonex to locate variable core site for soil sampling, examined by ESAP software.
- e. Analysis of general soil physio-chemical properties (0-30 and 30-60 cm depth), influencing soil ECa and crop yields, in laboratory by using standard Italian protocol.
- f. Validation of classified management zones through spatial soil properties.
- g. Examining the weather factors influencing crop yields over each specified year (temporal yield).

- Remote sensing

Title. Assessing Multiple Years' Spatial Variability of Crop Yields Using Satellite Vegetation Indices

- a. Retrieving of various Landsat remote imagery (NDVI, EVI, GNDVI, GCI, SAVI and SR) from Landsat 5-Thematic Mapper (TM), Landsat 7-Enhanced Thematic Mapper Plus (ETM+) and Landsat 8-Operational Land Imager (OLI) from US Geological Survey (USGS) - Earth Explorer platform, corresponded to various crops growth stages grown over five years.
 - b. Simple regression correlation between interpolated crop yield data and actual remote indices values over 5 years at 30 m grid resolution.
 - c. Geostatistic analysis on five years crop data and remote vegetation indices by using best fit geostatistical models (ArcGIS).
 - d. Pixel level correspondence and final agreement between crop yields and remote imagery maps.
2. I have been studied and worked in Department of Agriculture and Food Sciences-DISTAL, University of Bologna, Italy, under tutorship of Prof. Lorenzo Barbanti and Engr. Dr. Roberta Martelli (obtained my PhD degree during 1/11/2016 to 31/10/2019, **and currently working as a Research Fellow from 01/01/2020_to-date**).
 3. Worked at National Agriculture Research Centre (NARC) Islamabad, Pakistan, as Research Assistant under the project entitled "Rapid Identification of Olive Cultivars using DNA Markers" since 1st September 2013 to 31st January 2014. **Description:** Collection of olive sample from different location of Pakistan, DNA extraction, Gene sequencing and PCR analysis.
 4. Worked under project **IHSPT** (Indigenous Hybrid Seed Production Technology) since 1st March to 31st August 2013 at Maize, Sorghum and Millet program, Crop Sciences Institute (CSI) NARC, Islamabad under the supervision of Dr. Mozammil Hussain (PSO) and Dr. Muhammad Ashraf (PSO). **Description:** All field operations from land preparation to crop harvesting, layout of experiment, data collection of required parameters from Maize, Sorghum and Millet crops, statistical analysis and final report writing.
 5. Attended 2 months training at hydroponic farm, Shahdara, Lahore, Pakistan. **Description:** Operation of drip irrigation system and nutrients formulation, disease, insect/pest scouting at daily basis of small/large bitter gourd, tomato, lettuce, strawberry, and maintain the temperature & humidity within green house.
 6. My research topic in M. Sc. (Hons.) Agronomy was **Response of maize (*Zea mays* L.) to foliar application of potassium** and research work was completed at Maize program, NARC Islamabad under supervision of Dr. Mozammil Hussain (Principal Scientific Officer).

Scientific Publications:

1. **Ali, A.**, Scudiero E., Martelli, R., Falsone, G., Rondelli, V., Barbanti, L. (2021). Soil and Climate Factors Drive Spatio-temporal Variability of Arable Crop Yields under Uniform Management in Northern Italy. *Archives of Agronomy and Soil Science*. Online available but not completed yet with journal issue and page numbers. Link: [Soil and climate factors drive spatio-temporal variability of arable crop yields under uniform management in Northern Italy](#).
2. Hassan, M. U., Chattha, M. U., Khan, I., Chattha, M. B., Barbanti, L., Aamer, M., Iqbal, M. M., Nawaz, M., Mahmood, A., **Ali, A.** & Aslam, M. T. (2020). Heat stress in cultivated plants: nature, impact, mechanisms, and mitigation strategies-A review. *Plant Biosystems-An International Journal Dealing with all Aspects of Plant Biology*, pp.1-56. **IF 1.525**, ISI & Scopus Journal.
3. **Ali, A.**, Martelli, R., Lupia, F., & Barbanti, L. (2019). Assessing Multiple Years' Spatial Variability of Crop Yields Using Satellite Vegetation Indices. *Remote Sensing*, 11(20), 2384. **IF 4.118**, ISI & Scopus Journal.
4. Mustafa, G., **Ali, A***, Ali, S., Barbanti, L., & Ahmad, M. (2019). Evaluation of dominant allelopathic weed through examining the allelopathic effects of four weeds on germination and seedling growth of six crops. *Pakistan Journal of Botany*, 51(1), 269-278. **IF 0.755**, ISI & Scopus Journal.
5. Chattha, M. U., Hassan, M. U., Barbanti, L., Chattha, M. B., Khan, I., Usman, M., **Ali, A.**, & Nawaz, M. (2019). Composted Sugarcane By-product Press Mud Cake Supports Wheat Growth and Improves Soil Properties. *International Journal of Plant Production*, 1-9. **IF 0.961**, ISI & Scopus Journal.
6. Hassan, M. U., Chattha, M. U., Khan, I., Chattha, M. B., Aamer, M., Nawaz, M., **Ali, A.**, Khan, M. A. U., & Khan, T. A. (2019). Nickel toxicity in plants: reasons, toxic effects, tolerance mechanisms, and remediation possibilities—a review. *Environmental Science and Pollution Research*, 26(13), 12673-12688. **IF 2.914**, ISI & Scopus Journal.
7. Aamer, M., Muhammad, UH, **Abid, A.**, Su, Q., Liu, Y., Adnan, R., Tahir, A. K., & Huang, G. (2018). Foliar application of glycinebetaine (GB) alleviates the cadmium (Cd) toxicity in spinach through reducing Cd uptake and improving the activity of antioxidant systems. *Applied Ecology and Environmental Research*. 16, 7575-7583. **IF 0.721**, ISI & Scopus Journal.
8. **Ali, A***, Hussain, M., Habib, H. S., Kiani, T. T., Anees, M. A., & Rahman, M. A. (2016). Foliar spray surpasses soil application of potassium for maize production under rainfed conditions. *Turk J Field Crops*, 21(1), 36-32. **IF 0.8 (overall IF 3.88)**, ISI & Scopus Journal.
9. Anees, M. A., **Abid, A***, Shakoor, U., Farooq, A., Hasnain, Z., & Hussain, A. (2016). Foliar applied potassium and zinc enhances growth and yield performance of maize under rainfed

conditions. *International Journal of Agriculture and Biology*, 18(5). **IF 0.80**, ISI & Scopus Journal.

10. Habib, H. S., Malik, A. M., **Abid, A.**, & Khan, M. A. (2016). Socioeconomic determinants of rural household food expenditures in Rawalpindi. **Pakistan Journal of Agricultural Research**, 29(1). Approved Journal from Higher Education Commission of Pakistan (HEC).
11. ¹**Abid Ali***, ²Samraiz Ali. 2016. To evaluate the better response of foliar spray over soil application of potassium on maize yield under rainfed conditions. **Turkish Journal of Agricultural and Natural Sciences**, 3(1): 83–89.
12. Habib, H. S., Malik, A. M., Habib, H. A., & Ali, A. Food Inflation Knocks at the Welfare of Households: Empirical Sketches from Rawalpindi City, Pakistan. **International Journal of Social Footprints**, 1(1): 42-49.

Conference Proceedings:

1. **Ali A.**, Martelli R., Lupia F., Barbanti L. 2019. Estimating Spatial Variability of Crop Yields Using Satellite Vegetation Indices. In: Poster Proceedings of the 12th European Conference on Precision Agriculture, July 8-11, Montpellier, France. p. 16. E-book publication. SupAgro Montpellier. ISBN 978-2-900792-49-0.

Computer Skills:

Attended 3 month computer course at House of Information Technology in Lalazar Rawalpindi cant, Pakistan and have excellent command on following:

- MS Window
- MS Word
- MS Excel
- MS PowerPoint
- Internet Surfing Techniques, etc

Competencies:

- Results Focus
- Teamwork
- Communication
- Building Effective Relationships

- Knowledge Sharing and Continuous Improvement

Functional Skills:

- Excellent skills on report writing, review paper, research papers, fluent in English and Urdu speaking within inter and intra personal communications.
- I got 2nd and 1st position in “Pak Study” Quiz competitions at District level in 9th and 10th class, respectively, from Govt. High School Shakargarh, Narowal.
- English proficiency letter awarded by Dean Faculty of crop and food sciences, PMAS-Arid Agriculture University Rawalpindi.
- I got Higher Education Commission (HEC) Pakistan-Merit and need based scholarship in M. Sc. (Hons.) Agriculture in Agronomy.
- I got competitive PhD scholarship by DISTAL, University of Bologna, Italy
- Laptop awarded by Govt. of Punjab 2014, based on high grade marks.