Ibrahim S. Elbasyoni, Ph.D.

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Professional Summary

Accomplished plant breeding and genetics scientist with over 15 years of experience in academic research and applied agricultural development. Expertise in functional phenomics, genomic selection, and breeding for biotic and abiotic stress tolerance in major crops, including wheat, barley, and date palm. Proven ability to lead multidisciplinary projects, secure competitive research funding, and publish impactful findings in peer-reviewed journals. Skilled in integrating advanced statistical and bioinformatics tools to enhance breeding programs. Dedicated to advancing sustainable agricultural practices and improving crop productivity under diverse environmental conditions.

Professional Experience

2022–2025 Research Scientist (R4)
King Abdullah University of Science and Technology (KAUST), Saudi Arabia
Manager: Prof. Jesse Poland

- Lead key research projects, supervise experimental designs, and guide postdocs and graduate students through mentorship, committee involvement, and day-to-day direction on research tasks and implementation
- Direct and oversee field research activities, coordinate daily operations and objectives, implement field research tasks, and provide performance feedback to the field team
- Collaborate on grant writing and manuscript preparation, introduce advanced techniques to the research group, contribute to the research strategy with the PI, and represent the research group at conferences and collaborations

2020-2021 Research Assistant Professor
University of Nebraska-Lincoln, USA
Manager/Supervisor: Prof. Dr. P. Stephen Baenziger

- Developed pipelines linking phenotypic traits with molecular markers to improve breeding efficiency
- Collaborated with global laboratories to optimize Nebraska's wheat program marker platforms
- Created training populations for genomic prediction in wheat
- Presented findings to the scientific community

2018– until now Associate Professor
2013–2018 Assistant Professor
Damanhur University, Egypt

- Led breeding programs for spring wheat, barley, and triticale to enhance cereal grains production
- Introducing new genetic resources
- Supervised graduate students and taught courses on plant breeding and experimental design

2003–2009 Teaching Assistant and MSc Student
Alexandria University, Egypt

- Teaching courses related to self-pollinated crops, molecular markers, and statistics for undergraduate students.

Postdoctoral Fellowships

2016–2018 University of Nebraska-Lincoln, USA, Integrated High Throughput Phenomics and Genomics Approaches to Improve Drought Stress Tolerance in Wheat. Supervisor: Dr. Ismail Dowikat

2012–2013 University of Nebraska-Lincoln, USA, Genomic Selection in Wheat Breeding. Supervisors: Dr. Stephen Baenziger and Dr. Aaron Lorenz.

Appointments

2019-2020 and **2017-2018 General secretary of the crop science board**
Damanhur University

2014-2017 Director of the faculty of Agriculture experimental and production farm
Damanhur University

Education

2010-2012 Doctor of Philosophy
University of Nebraska-Lincoln, USA
Doctor of Philosophy, Agronomy and Horticulture
Specialization: Plant Breeding and Genetics
Dissertation: "Association Mapping for Important Biotic and Abiotic Related Traits in Structured Wheat Populations"

2003-2006 Master of Science
Alexandria University, Egypt
Master of Science, Crop Science
Specialization: Plant Breeding and Genetics
Dissertation: "*In vitro* Selection for Salinity Stress Tolerance in Wheat"

1998-2002 Bachelor of Science
Alexandria University, Egypt General Plant Production

Research Grants and Funding

2025 Developing Date Palm Tree Service Techniques and Industrial Dates Production Process (Co-PI), Six million US dollars

2024 Improving the Efficiency of Date Palm Production in KSA (Co-PI, funded by Ministry of Environment, Water and Agriculture (MEWA)), Six million US dollars

2020 High-Intensity Phenotyping Sites (NIFA, USA, Researcher), Five million US dollars

2016 Global Spring Wheat Collection Evaluation for Drought Tolerance and Rust Resistance (STDF, Egypt, Principal Investigator), One million US dollars

Awards and Honors

2019 Arab & American Frontiers Award in Science and Technology Developments

2018 Distinguished Scholar Award, Arab Fund for Economic and Social Development

2011 Research Assistantship, University of Nebraska-Lincoln

2009 Scholarship, Egyptian Ministry of Higher Education

2002 Awarded permanent teaching position for academic excellence

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Oral Presentations

2024 All Hands Meeting: "Enhancing date palm production & sustainability in KSA, Plant Science" (Within KAUST internal monthly meeting)

2021 Damanhur University: "National and international collaboration in plant breeding: Wheat Example" (International conference)

2017 Damanhur University: "Wheat breeding for drought tolerance" (International conference)

2016 Damanhur University: "R applications in data mining and plant breeding" (Seminar)

2015 Cairo University Egypt: "R as a bioinformatics platform" (Seminar)

Posters

2024 Grand Opening of KAUST/NCVC Experiment Station and Ecological Observatory
"Harnessing the Power of Prickly Pear in the Kingdom of Saudi Arabia"

2019 ASA, CSSA and SSSA International Annual Meetings
"Evaluation of a Spring Wheat Panel for Drought Stress Tolerance", I Elbasyoni, PS Baenziger

2014 Plant and Animal Genome XXII Conference. Plant and Animal Genome
"Genomic Selection for Nitrogen Use Efficiency Using Canopy Spectral Reflectance in Hard Winter Wheat", Frels,K., Guttieri, M., El-Basyoni, I.; E.Akhunov, and P. Baenziger

2014 Plant and Animal Genome XXII Conference. Plant and Animal Genome
"Genetic Variation for Grain Cadmium in Hard Winter Wheat", In Guttieri, M., K. Frels, B.Waters, El-Basyoni,I; E.Akhunov, and P. Baenziger

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Peer reviewer in the following Journals

Plant Breeding (2025), Plant Physiology (2024), Crop Science (2023), Plant Science (2023), Agronomy (2021)

International collaboration

CIMMYT (Mexico): yearly, I receive from 300 to 400 elite wheat lines to evaluate in our experimental farm for yield and abiotic stress

INRA (France): Identification of new genetic stem rust-resistant spring wheat lines

The University of Minnesota (USA, 2020): Collection of two and six-rowed barley lines were evaluated in Egypt for rust resistance and grain yield.

University of Nebraska-Lincoln (USA): Yearly evaluation of around 400 winter wheat, barley, and triticale lines at Damanhur University experimental farm for biotic and abiotic stresses

Colorado State University (USA, 2014): building a genomic selection analysis pipeline using R software

USDA-ARS, National Small Grains Collection (USA, 2019): The core collection of the global spring wheat collection was evaluated in Egypt for biotic and abiotic stresses in our Experimental far

Public Outreach and Society Service

- Direct Interaction with Farmers in Saudi Arabia
  From 2022 to the present, I have conducted numerous field visits to date palm farms across various regions in the Kingdom of Saudi Arabia. These visits allowed me to engage directly with date palm farmers, gaining firsthand insights into their challenges, production systems, and priorities. Through this interaction, I have been able to align research objectives with practical needs, helping to ensure that scientific advancements are effectively translated into field-level solutions. I also collaborated closely with the Ministry of Environment, Water, and Agriculture (MEWA) to support national initiatives focused on improving date palm productivity, sustainability, and genetic improvement. This direct connection with farmers and policymakers has provided a unique perspective that will significantly enhance the applicability and impact of my future research, particularly in designing breeding strategies and deploying technologies that are tailored to real-world agricultural conditions.

- Released varieties and cultivars
  Wheat cultivars: “‘NE10589” (Husker Genetics Brand Ruth), and “NE15420” (Husker Genetics Brand Epoch). In addition, three barley lines are currently under registration. Several drought and salinity-stress-tolerant wheat lines were identified and are being used in several breeding programs in Egypt.

- Field Days
  2019 Small grains field days, University of Nebraska-Lincoln, USA

  2017 Small grains field day, Damanhur University experimental farm, Egypt

  2016 Small grains field day, Damanhur University experimental farm, Egypt

  2015 Small grains field day, Damanhur University experimental farm, Egypt

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Professional and Interpersonal Skills

Laboratory and Field Related Skills

During my education and fieldwork, I gained skills related to cereal grains breeding, such as GPS planting, combine harvesting, phenological data acquisition, molecular data analysis, genomic selection, and association mapping.

Data Analysis and Languages Related Skills

Technical: Genomic selection, association mapping, high-throughput phenotyping, R, SAS, ASReml.

Programming & Analysis: Advanced R scripting, statistical modeling, bioinformatic Experimental Techniques: GPS planting, combine harvesting, and molecular data analysis.

Languages: English (Fluent), Arabic (Native).

Interpersonal Skills and Leadership Skills

Currently, I am a research scientist in the Plant Breeding and Genetics Laboratory at KAUST, where I lead key research projects and oversee experimental design. I mentor postdoctoral researchers and graduate students, serve on research committees, and provide daily direction on research activities and implementation. I play a central role in grant writing and manuscript preparation and lead the publication of primary research as an author, co-author, or senior author.

One of my major contributions has been driving research efforts in date palm genetics and breeding, where I play a pivotal role in managing national grants and partnerships, including projects funded through the Ministry of Environment, Water and Agriculture (MEWA). I actively engage with farmers and stakeholders beyond KAUST, conducting field visits, facilitating knowledge transfer, and ensuring that applied research directly addresses grower needs. I also direct field research operations, coordinate daily field tasks, oversee performance evaluations, and contribute to the research group's strategic direction in close collaboration with the principal investigator. Additionally, I introduce advanced technologies and techniques to enhance the lab's research capabilities and represent our group at national and international conferences and through external collaborations.

Previously, at Damanhur University, I led the wheat and barley breeding programs, overseeing multiple testing locations across Egypt and working with a multidisciplinary team to advance elite germplasm lines. I served as principal investigator for two wheat breeding projects and chaired the undergraduate education committee within the Faculty of Agriculture, playing a key role in the academic accreditation process.

Graduate Students

Padam Poudel; MSc. (KAUST, KSA); project title: "Assessment of Saltgrass (Distichlis spicata) for Forage Production in Saudi."

Mohamed Shaaban; MSc. (Damanhur University, Egypt); project title: "Evaluation of CIMMYT elite lines and Egyptian cultivars under low input conditions in Egypt."

Nor Elsayed Nor Eldeen; MSc. (Damanhur University, Egypt); project title: "The effect of heat stress on wheat production in Egypt."

Hamada Elsayeedl; MSc. (Damanhur University, Egypt) his project: “The effect of salinity stress on wheat production in Egypt.”

Research Interests

My research focuses on connecting fundamental breakthroughs in agricultural science with their practical implementation in plant breeding and genetics. I strive to convert innovative scientific discoveries into actionable solutions that improve crop productivity, enhance resilience, and promote sustainability.

By integrating advanced genetic technologies, state-of-the-art breeding methodologies, and data-centric strategies, my work addresses critical agricultural challenges, including food security, climate adaptation, and efficient resource utilization. Through collaboration across disciplines, I aim to transform theoretical knowledge into impactful results that benefit farmers**.**

Publications

Elbasyoni, I.S., S. Morsy, A.M. Abdelghany, M. Naser, A.M. Mashaheet, et al. 2023. Nebraska winter wheat unexpected flowering in Egypt: New improvement opportunities. Agron. J. 115(2): 698–712. doi: 10.1002/AGJ2.21243.

Baenziger, P.S., K.A. Frels, J. Boehm, V. Belamkar, D.J. Rose, et al. 2022. Registration of ‘Epoch’ hard red winter wheat. J. Plant Regist. 16(3): 613–621. doi: 10.1002/PLR2.20247.

Baenziger, P.S., R.A. Graybosch, D.J. Rose, L. Xu, M.J. Guttieri, et al. 2020. Registration of ‘NE10589’ (Husker Genetics Brand Ruth) hard red winter wheat. J. Plant Regist. 14(3): 388–397. doi: 10.1002/PLR2.20068.

Baenziger, P.S., I. Salah, R.S. Little, D.K. Santra, T. Regassa, et al. 2011. Structuring an efficient organic wheat breeding program. Sustainability 3(8): 1190–1205. doi: 10.3390/SU3081190.

Belamkar, V., M.J. Guttieri, W. Hussain, D. Jarquín, I. El-basyoni, et al. 2018. Genomic Selection in Preliminary Yield Trials in a Winter Wheat Breeding Program. G3 Genes|Genomes|Genetics 8(8): 2735–2747. doi: 10.1534/G3.118.200415.

El-Basyoni, I., P.S. Baenziger, I. Dweikat, D. Wang, K. Eskridge, et al. 2013. Using DArT Markers to Monitor Genetic Diversity throughout Selection: A Case Study in Nebraska’s Winter Wheat Breeding Nurseries. Crop Sci. 53(6): 2363–2373. doi: 10.2135/CROPSCI2013.01.0051.

El-Orabey, W.M., I.S. Elbasyoni, S.M. El-Moghazy, and M.A. Ashmawy. 2019. Effective and Ineffective of some Resistance Genes to Wheat Leaf, Stem and Yellow Rust Diseases in Egypt. J. Plant Prod. 10(4): 361–371. doi: 10.21608/JPP.2019.36269.

Elasyoni, I.S., W.M. El-Orabey, P.S. Baenziger, and K.M. Eskridge. 2017. Association Mapping for

Leaf and Stem Rust Resistance Using Worldwide Spring Wheat Collection. Asian J. Biol. 4(3): 1–25. doi: 10.9734/AJOB/2017/38120.

Elbasyoni, I. Performance and Stability of Commercial Wheat Cultivars under Terminal Heat Stress. Agronomy. https://www.academia.edu/61695477/Performance_and_Stability_of_Commercial_Wheat_Cultivars_under_Terminal_Heat_Stress (accessed 17 April 2025).

Elbasyoni, I.S., A.M. Abdallah, S. Morsy, and S. Baenziger. 2019a. Effect of Deprivation and Excessive Application of Nitrogen on Nitrogen Use Efficiency-Related Traits Using Wheat Cultivars, Lines, and Landraces. Crop Sci. 59(3): 994–1006. doi: 10.2135/CROPSCI2018.09.0564.

Elbasyoni, I.S., W.M. El-Orabey, S. Morsy, P.S. Baenziger, Z. Al Ajlouni, et al. 2019b. Evaluation of a global spring wheat panel for stripe rust: Resistance loci validation and novel resources identification. PLoS One 14(11): e0222755. doi: 10.1371/JOURNAL.PONE.0222755.

Elbasyoni, I.S., S. Eltaher, S. Morsy, A.M. Mashaheet, A.M. Abdallah, et al. 2022. Novel Single-Nucleotide Variants for Morpho-Physiological Traits Involved in Enhancing Drought Stress Tolerance in Barley. Plants 11(22): 3072. doi: 10.3390/PLANTS11223072/S1.

Elbasyoni, I.S., A.J. Lorenz, M. Guttieri, K. Frels, P.S. Baenziger, et al. 2018a. A comparison between genotyping-by-sequencing and array-based scoring of SNPs for genomic prediction accuracy in winter wheat. Plant Sci. 270: 123–130. doi: 10.1016/J.PLANTSCI.2018.02.019.

Elbasyoni, I.S., S.M. Morsy, M. Naser, H. Ali, K.P. Smith, et al. 2020. Reverse introduction of two- and six-rowed barley lines from the United States into Egypt. Crop Sci. 60(2): 812–829. doi: 10.1002/CSC2.20061.

Elbasyoni, I.S., S.M. Morsy, R.K. Ramamurthy, and A.M. Nassar. 2018b. Identification of Genomic Regions Contributing to Protein Accumulation in Wheat under Well-Watered and Water Deficit Growth Conditions. Plants 2018, Vol. 7, Page 56 7(3): 56. doi: 10.3390/PLANTS7030056.

ElBasyoni, I., M. Saadalla, S. Baenziger, H. Bockelman, and S. Morsy. 2017. Cell Membrane Stability and Association Mapping for Drought and Heat Tolerance in a Worldwide Wheat Collection. Sustain. 2017, Vol. 9, Page 1606 9(9): 1606. doi: 10.3390/SU9091606.

Liu, Z., I. El-Basyoni, G. Kariyawasam, G. Zhang, A. Fritz, et al. 2015. Evaluation and association mapping of resistance to tan spot and stagonospora nodorum blotch in adapted winter wheat germplasm. Plant Dis. 99(10): 1333–1341. doi: 10.1094/PDIS-11-14-1131-RE/ASSET/IMAGES/LARGE/PDIS-11-14-1131-RE_T4-1442587078983.JPEG.

Lopes, M.S., I. El-Basyoni, P.S. Baenziger, S. Singh, C. Royo, et al. 2015. Exploiting genetic diversity from landraces in wheat breeding for adaptation to climate change. J. Exp. Bot. 66(12): 3477–3486. doi: 10.1093/JXB/ERV122.

Morsy, S.M., I.S. Elbasyoni, A.M. Abdallah, and P.S. Baenziger. 2022a. Imposing water deficit on modern and wild wheat collections to identify drought-resilient genotypes. J. Agron. Crop Sci. 208(4): 427–440. doi: 10.1111/JAC.12493.

Morsy, S., I.S. Elbasyoni, and S. Baenziger. 2021. Saline Water Threshold Level that Maximizes Grain Yield Production and Minimizes Sodium Accumulation for Salinity Stress-sensitive and Tolerant Wheat Cultivars. Asian J. Res. Crop Sci.: 9–28. doi: 10.9734/AJRCS/2021/V6I130107.

Morsy, S., I.S. Elbasyoni, S. Baenziger, and A.M. Abdallah. 2022b. Gypsum amendment influences performance and mineral absorption in wheat cultivars grown in normal and saline-sodic soils. J. Agron. Crop Sci. 208(5): 675–692. doi: 10.1111/JAC.12598.

Naser, M., M. Badran, H. Abouzied, H. Ali, and I. Elbasyoni. 2018. Phenotypic and Physiological Evaluation of Two and Six Rows Barley under Different Environmental Conditions. Plants (Basel, Switzerland) 7(2). doi: 10.3390/PLANTS7020039.

Siddig, M.A. El, I. Dweikat, S. Baenziger, A.A. El Hussein, and I.S. Elbasyoni. 2013. Genetic Diversity Among Sudanese Wheat Cultivars as Revealed by Molecular Markers. Middle-East J. Sci. Res. 14(9): 1135–1142. doi: 10.5829/idosi.mejsr.2013.14.9.2943.

Wang, M.Y., P.S. Baenziger, I.S. El-Basyoni, and S.N. Wegulo. 2015. Comparison of fusarium head blight resistance in cytoplasmic male sterile, maintainer and restorer lines in winter wheat. Cereal Res. Commun. 43(3): 374–383. doi: 10.1556/0806.43.2015.006/METRICS.

Wang, D., I. Salah El-Basyoni, P. Stephen Baenziger, J. Crossa, K.M. Eskridge, et al. 2012. Prediction of genetic values of quantitative traits with epistatic effects in plant breeding populations. Hered. 2012 1095 109(5): 313–319. doi: 10.1038/hdy.2012.44.

Amer, H., M.Z. Dakroury, I.S. El Basyoni, and H.M. Abouzied. 2021. Phenotypic and Physiological Evaluation of Wheat Genotypes under Non-Saline and Saline Soil Conditions. Asian J. Res. Crop Sci.: 29–43. doi: 10.9734/AJRCS/2021/V6I130108.

References

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