

# Researcher Business Card:

**Dr. Najeeb Ullah, how would you present yourself to the University community and the readers of the Research Magazine?**

I am Dr. Najeeb Ullah, an Assistant Research Professor at the Agricultural Research Station (ARS) Qatar University. With over 15 years of experience in agricultural sciences, my research primarily focuses on improving crop productivity under abiotic stresses. Currently, I am developing innovative solutions to improve the productivity and profitability of Qatari farms, using advanced technologies such as artificial intelligence and nanotechnology.

**What are the key milestones that have shaped your academic and research journey in the field of agricultural sciences?**

I completed my PhD at the University of Sydney and then worked in the leading Australian institutes, developing techniques to protect crops from extreme climates. At Qatar University, my research focuses on the integration of modern technologies into agricultural research. I have developed protocols for cultivating high-quality leafy green vegetables in the greenhouse. Using this technique, we successfully produced selenium-fortified (an essential microelement for humans) lettuce crops.

**Tell us about your most significant research projects and achievements in the agricultural sector.**

Apart from the application of modern research techniques, we evaluate different crops for their adaptability to Qatari climates. We identified opportunities to reduce water use by up to 500 ml/m<sup>2</sup> for vegetable crops without compromising yield, highlighting inefficiencies in current irrigation practices and emphasizing the potential for sustainable water management.

**What are the latest advancements in agricultural physiological techniques that contribute to improving food crop production?**

Recent advancements include the use of AI-based imaging technology to monitor plant growth, diseases, and crop nutritional quality. We are setting up an AI-assisted system to monitor the growth and development in the vertical farm facility. This will



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allow rapid and efficient identification of superior germplasm suitable for Qatari climates. Additionally, we are using nanotech solutions to improve nutrient uptake in hydroponically grown crops.

**As a professor of agricultural studies, tell us how we can encourage students to engage in this field, considering the country's goal of achieving self-sufficiency and food security?**

Students should be engaged through hands-on fieldwork and laboratory research to understand real-world agricultural challenges. Internship opportunities with ARS farm can give them practical experience and inspire them to contribute to Qatar's food security goals. At ARS, we engage students in developing automated hydroponic systems, allowing them to understand how cutting-edge technologies e.g. vertical farming, AI-driven crop management, and nanotechnology can assist agricultural production systems.

**How will research serve the future of sustainable agriculture in Qatar? To what extent can modern technologies, such as artificial intelligence and biotechnology, enhance agricultural sustainability, address the challenges of an arid climate, and meet future demands?**

Modern technologies like AI, biotechnology, and automated systems are revolutionizing agriculture. My work on heat- and salt-tolerant crops like quinoa and barley highlights how genetic research enhances resilience. AI-assisted phenotyping enables rapid screening of drought-resistant crops, while automated hydroponics optimizes resources and boosts yields, advancing sustainability and food security.