Hands-on Training Workshop on Variable Rate Spraying Technology Development (Phase-I)

15-19 December 2020

Jointly Organized By

Pilot Project for Data Driven Smart Decision Platform for Increased Agriculture Productivity (DDSDP)	Faculty of Agricultural Engineering and Technology (FAE&T)	Office of Research, Innovation and Commercialization (ORIC)

Sponsored By: Higher Education Commission of Pakistan

Background

The variable rate technology (VRT) offers an opportunity to improve production efficiency by allowing input applications in amounts and locations where they are needed. The basic idea of VRT is to allocate agricultural inputs more efficiently by exploiting spatial variations in soil type, topographic features, fertility levels, and other field characteristics. Variable rate application includes GPS and GIS map-based, "on-the-go" sensor-based, or a combination of map and sensors. In the map based approach, disease detection, generation of application maps and variable-rate spraying are performed in consecutive, separate operations, if weather conditions are favourable, diseases can quickly spread over the whole field. In recent years, real-time technology has been introduced into the practice of spraying variable fungicides/ herbicides.VR sprayer consists of sensors/cameras, computerized controllers, solenoid valves and custom image processing software capable of detecting weeds/plants/bare spots to spray herbicide/fungicide/insecticide in a specific section of the boom where the target is detected. This training workshop is a part of the project titled *"Data Driven Smart Decision Platform for Increase Agriculture Productivity"*.

Objectives

- To develop capacity building of Academia, Industry, Research Organizations, Farmers and Students for developing Variable Rate Spraying Technologies.
- To provide an opportunity to develop consortium of Academia, Industry, Research Organizations and Farmers for commercialization of this Technology.

Training Modules

- Introduction to the VRT Spraying Technology
- Design Development
- Sensors: Detail and Features
- Assembling of the sensors
- Configuration
- Training data set
- Testing/Field Demonstration

Resource Person

Engr. Hassan Afzaal is currently working as a Research Assistant in the Faculty of Sustainable Design Engineering, University of Prince Edward Island (UPEI), Canada. He successfully defended his Master degree from the same university with research focus on supplemental irrigation water management using deep learning and artificial intelligence technologies. His thesis research results published in three highly reputed and impact factor Journals. He was key contributor in the team to calibrate various sensors/cameras and testify their potential to be used for weed and disease identification. He integrated the hardware (nozzles, valves, toggle switches, flow meters, etc.) with the custom developed software (deep learning, artificial intelligence, computer programing, modeling and deployment) to develop a prototype variable rate sprayer. Efforts of Engr. Afzaal and his team members to this project may leads to industrialization of smart variable rate sprayer for potato cropping system in Atlantic Canada. He has wide experience in deep learning algorithms, machine vision systems, internet of things and geographic information systems. He is also involved in several Artificial Intelligence and Precision Agriculture related projects in UPEI.

Organizing Committee

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- Prof. Dr. Qamar-Uz-Zaman (Vice Chancellor)

Convener:

- Dr. Muhammad Naveed Tahir

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