The New Agriculture Paradigm in Korea, Digital Agriculture

Kyeong-Hwan Lee

Abstract

The global agriculture and food industry is facing four main challenges: increased global population, constrained natural resources, climate change reducing productivity, and food waste causing market inefficiency and environment threat. Digital agriculture system (DAS) will be effective strategies to overcome the challenges. In this presentation, I will introduce technologies for digital agriculture in Korea and its applications. The technologies used in DAS include sensors, information communication technology, big data, artificial intelligence (AI), unmanned aerial vehicle (UAV), and robotics. The inputs of DAS are labor, chemicals, water, energy and the outputs are yield and the quality of product. DAS consists of three components: sensing system for monitoring crop and field, decision making system for making optimum decisions in supplying inputs using big data and AI, and actuating system for delivering the decided inputs to crop and field precisely using UAVs and robots. The outputs are feedbacked to the decision making system and the decision will be updated based on both the feedbacked outputs and the planned inputs. DAS keeps run through the feedback loop. It will be stablized when the inputs and outputs reach minimum and maximum level, respectively. Therefore, DAS enables farmers and other stakeholders within the agriculture value chain to improve production efficiency. It also enables to build trust between producer and consumer by sharing information gathered during agricultural production.

Keywords: artificial intelligence, decision making system, digital agriculture, robotics, sensor