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Soybean Cultivation, Environmental Big Data Collection, Data-base Farmhouse Consulting

Jung-Mi Park[1]*, Hyunjung Choi[1], ByungIk Min[1], SungWon Park[1], LiNa Kim[1], MinJa Kim[1]

[1]Crop Research Division, Chungbuk Agricultural Research and Extension Services

[Introduction]

Information and communication technology, big data, and artificial intelligence are rapidly developing in the 4th Industrial Revolution, and in agriculture, smart farms are spreading through these technologies, helping to improve the quality of life and productivity in agriculture. In addition, productivity improvement models based on crop growth, environment, and management data necessary for stable operation of smart farms are being actively developed. In recent years, smart agriculture has spread to alleys, and by using alley crop growth and irrigation, soil environment, and meteorological data, precision material management, meteorological disaster early warning systems, integrated control systems, midpoint irrigation models, pest prediction digital traps, etc.

In Buljeong-myeon, Goesan-gun, Chungcheongbuk-do, an open-air smart complex of 53 ha is formed. In this study, data were collected from 9 soybean farms in the open-air smart complex to develop a productivity improvement model and conduct data-based field consulting.

[Materials and Methods]

For agricultural big data collection, growth and soil environment data were collected by visiting soybean cultivation sites at 10-day intervals. For growth data, 30 weeks per farm were investigated for plant height, long length, light tare, number of main stem nodes, and number of branch nodes, and post-harvest investigations were conducted on light weight, tuberous weight, number of pods, protein content, fat content.

[Results and Discussion]

Based on the collected data, on-site consulting was conducted once every two weeks for each farm. By comparing and analyzing growth data for each farm, the current crop status was informed, and changes in soil temperature, moisture, and EC were identified to provide consulting tailored to farm household conditions, such as farm environmental management methods and decision-making favorable to farm management.

The results of the soybean growth survey in the Noji Smart Complex in Goesan showed that the average daytime plant height was 114cm, the length was 67.4cm, and there were three branches. It can be seen that the average number of main gorges was 39, and the number of branching gorges was 23. The soil environment averaged 20-23.8°C during the day and 19.9-23.1°C at night, and the soil moisture was 15.3-33.9%.

The collection and analysis of big data on soybeans will be the basis for not only developing a production improvement model, but also building an infrastructure that can manage and guide scientific farming, such as precision water management and operation of an integrated control system.

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*Corresponding author: E-mail. hosu3457@korea.kr Tel. +82-43-220-5581