

Pursuing the Potential of "Smart Agriculture" in Urban Agriculture

As the number of agricultural workers declines and the population ages, the domestic market for "smart agriculture," which combines conventional agricultural technology and ICT for agricultural work, is expected to more than double in the next six years.

Smart agriculture has a wide range of applications, including robotic agricultural machines, remote sensing, and AI that can control and identify the quality of crops.

Agriculture in Kanagawa Prefecture is characterized by its limited location and land area, as the scale of production is not that large.

In addition, there are production contracts due to a shortage of workers, and the operational burden of managing and working while moving through scattered "fields" is a major issue.

In order to verify the effect of the introduction of "smart agriculture" in light of the current situation and challenges of urban agriculture, the NTT EAST Kanagawa Division conducted a demonstration experiment on the use of paddy field water level sensing to reduce roundtrip operation.

JA Shonan, who is well versed in local agricultural affairs, was consulted to select the demonstration field and cooperative farmers.

Naomichi Yokoyama, a cooperative farmer, is also a registered Eco-Farmer Certified by the Governor of Kanagawa Prefecture.

He is a young farmer from Isehara City who takes on new challenges, such as selling Harumi, a rice product produced through a flea market app, while farming in consideration of the natural environment.

Harumi is the first rice variety from Kanagawa Prefecture to receive a Special A rating.

(Interview)

"The rice fields are 12 towns and the fields are 6 tan."

(Interview)

"In this area, the rice fields are small and there are many outlying areas, so it is difficult to

move machines."

"As it is a family business, I feel a shortage of manpower when the area under management increases."

(Interview)

"It takes about 2 hours on a day that takes time."

(Interview)

"Last year (2022), his father passed away, and he took the initiative to carry out farm work, and he wanted to take various new initiatives."

This demonstration is based on NTT EAST's overall design and consulting, and the provision of water level and water temperature sensors from the Internet Initiative.

The system was established and implemented with the provision of a water supply gate and IoT platform from Enowa.

It has a communication box at the top and a water level sensor at the bottom and measures every 30 minutes.

The measurement results are displayed in the smartphone app.

If the value exceeds or falls below the preset value, the smartphone is notified.

The water gate can be opened and closed in three steps from your smartphone.

It can be automatically controlled by setting the specified water level and water temperature.

It also has an immer function, so you can set the water container in the middle of the night and the water stop in the morning.

Paddy water level management is very important. Securing water after planting and mid-drying has a big impact on rice growth.

If the water is low, weeds will grow, and if the water is deep, this will cause eating damage by the Japanese apple snail (Jumbo tanishi).

(Interview)

"There are a lot of enclaves, and it's hard to go to many places multiple times to manage the water level, so I think it's easy to manage it all at once with a computer."

(Interview)

"It's very easy to use and you can make detailed settings, so I felt it was easy to handle."

In this demonstration, we compared patrolling operations at 3 different locations under different conditions.

In May, which is the soil preparation period, there will be a lot of work to open and close the sluice gate to improve the soil.

Since the sluice gate can be opened and closed remotely, the number of on-site work has been reduced by more than half.

In July, which is the mid-drying season, water should not enter, so the presence of water can be checked remotely thanks to the water level sensor, which proved to be convenient.

During the harvest season from August to September, the water level is a concern when there is heavy rain or a typhoon hits. Thanks to the sensors, Yokoyama was able to check the water level remotely at any time of day or night, which gave him peace of mind.

In the future, we will pursue the possibility of expanding the application area of smart agriculture from the field perspective, as remote confirmation and remote control for other operations will lead directly to reduced operation.