

The Maxell Group's CSV Business Management

Maxell x SDGs

CSV Example 2

Contributing to higher quality and efficiency in agriculture

Promotion of smart agriculture with IoT and AI technologies

Rice Scan



Maxell's analog core technologies



Rice Scan Sensor device

Wireless communication



Mobile terminal + cloud system

Proprietary algorithms and analysis techniques



Server

Viewing, analyzing, and utilizing downloaded data



Provide benefits to users

Commercialization

Business Development

Market Penetration



Japan's agricultural industry is facing serious issues as the decline in the number of agricultural workers*1 is making it difficult for veteran farmers to pass their skills on to newer workers while simultaneously reducing the area of farmed land. The Maxell Group strives to address this issue by supporting higher quality and efficiency in agricultural work by promoting smart agriculture that utilizes AI and IoT technologies to greatly reduce labor requirements and heighten quality.

Decrease in Number of Agricultural Workers

(Thousands of people)

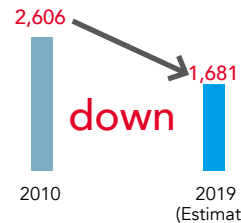


Chart prepared by Maxell Holdings, Ltd., based on "Number of Agricultural Workers and Core Agricultural Workers" (Ministry of Agriculture, Forestry and Fisheries)

*1 The number of agricultural workers is calculated as the number of members of agricultural households aged 15 years or older who only worked in agriculture during the one-year period ending with the day prior to the survey or those who worked simultaneously in agriculture and in other jobs but for whom the number of days worked in agriculture exceeded the number of days worked in other jobs.

Promotion of Smart Agriculture Using Measurement Data

In June 2018, the Maxell Group launched the *Rice Scan* service, which supports crop growth by facilitating convenient measurement of the leaf colors of paddy rice and other crops. In this service, leaf color images collected via a dedicated close-up camera device with built-in light source are sent to a portable terminal that analyzes the images. The analysis results are saved onto a cloud server to eliminate the need for conventional note-taking, data input, and tallying.

Furthermore, visual representations of the measured data are provided to support appropriate fertilizer management and growth diagnosis in order to contribute to higher quality and efficiency in crop production.

Commencement of Measured Data Visual Representation and Analysis Services

Growth diagnosis based on leaf color management in agriculture, particularly in the cultivation of paddy rice, is a viable means of identifying optimal conditions regarding harvest volumes, protein content, and inspection grades.

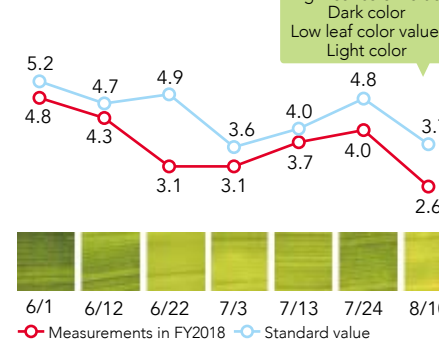
Rice Scan is expected to be used in high-value-added agricultural operations for producing

brand-name rice and sake rice as well as tea leaves for making green tea. Use of this service has begun in the Kanto and Northern Kanto regions of Japan, where it is primarily being utilized at test sites with only a few workers but a large number of areas needing to be observed as well as by producers to share information with contract farmers.

In fiscal year 2019, we bolstered *Rice Scan*'s measured data visual representation and analysis functions with the addition of a function that provides visual reference of the measurement

Measurement Result Confirmation Screen

Paddy Rice Leaf Color



Management of proper value using visual representation of leaf color changes

timing and positions of leaf color changes. Moreover, *Rice Scan* features a function that uses cameras to judge leaf color, which was developed based on the same concept as Maxell's *Hada more* skin check service. Accordingly, *Rice Scan* goes beyond simple measurements to record information on leaf colors and locations and thereby provides information that would normally be difficult to track without being on-site. The service also uses a structure that is relatively uninfluenced by external light to allow for measurements regardless of weather or time.

Market Penetration Initiatives

It is currently commonplace to diagnose leaf color based on leaf color scales or soil and plant analyzer development (SPAD)*2 meters. As such, Maxell must overcome the challenge of raising the market recognition of *Rice Scan* given that the service was only launched in fiscal year 2018.

To raise recognition, we intend to focus on advertising the benefits of *Rice Scan* over leaf color scales and SPAD meters, namely, its ability to automatically save leaf color diagnosis information on cloud services for use in data analysis.

In the future, we will look to introduce an area management system into the *Rice Scan* service that will provide visual representations of growth status. Such a system would enable agricultural production directors in remote locations or AI to provide accurate instructions and thereby contribute to increased quality and profitability throughout the entirety of agricultural operations.

*2 A metric that indicates the amount of chlorophyll contained within a leaf.