

Development of Information Technology Both in Agriculture and Human Resources®

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The situation surrounding Japan's agriculture today is extremely severe. It is full of problems such as adjustment and liberalization of rice production, expansion of abandoned cultivated land, aging of farmers, lack of successors, reduction in agricultural income, reduction in food self-sufficiency, overflow of biological waste, and uncertainty about food safety. Above all, the situation is especially severe with respect to rice-growing agriculture. With the hourly wage as low as 200 yen, the migration of young generations away from agriculture and the resulting expansion of land left idle is progressing.

In the case of industrial products, if the necessary materials are supplied to a manufacturing plant under appropriate conditions, products of constant quantity and quality are systematically produced at planned timings. But in the case of field-crop agriculture, even if materials such as seeds and seedlings, agrochemicals, and fertilizers are supplied to a field, the crop is greatly influenced by climate, soil quality, coexisting organisms, etc., resulting in a variation in the harvesting season, production volume, and product quality. In addition, agricultural products are highly perishable. To solve these problems, it is necessary to cultivate crops under a protected production environment like factory production, and further development of greenhouse horticulture and plant factories is expected.

Toyohashi City in Aichi Prefecture is said to be the birthplace of Japan's greenhouse horticulture, with a history of more than 100 years, and it recorded the largest value of agricultural production in Japan before a municipal merger. Since the merger, the value of agricultural production of Tahara, a neighboring city of Toyohashi, has become the largest in Japan, and that of Hamamatsu the fourth largest, with Toyohashi the sixth largest, all belonging to a horticultural area, topping the list. However, the value of agricultural production in Higashimikawa, where Tahara and Toyohashi are located, peaked at 165 billion yen in 1995; it has now fallen by 10 billion yen.

In consideration of the severe agricultural situation in Japan and in order to reestablish agriculture as a business in which young people can securely engage, it is necessary to convert traditional seat-of-the-pants agriculture into data-based agriculture by introducing leading-edge information technology in agriculture. In addition, it will be necessary to promote cooperation between agriculture, commerce, and industry to establish agriculture as the sixth industry.

Toyohashi University of Technology, an engineering and technology university, in 2006 established the Research Center for Advanced Agrotechnology and Biotechnology in celebration of the 30th anniversary of its foundation, with the aim of sharing its systematic engineering technology with the agriculture of the

Higashimikawa area, which is one of Japan's leading farming areas. The university not only transfers engineering technology to agriculture, but also develops human resources as leaders of information technology in agriculture and coordinators as planners of plant factories.

Focusing on greenhouse horticulture as a profitable agriculture to which systematic engineering technology can be applied, this program introduces problems in relation to soil and fertilization; information technology in agriculture takes into consideration production, distribution, and sales of products; the development of human resources for plant factories; and cooperation with other industries in order to discuss a restoration of Japan's agriculture as a business.