Research on cultivation planning based on resource sharing among fruit growers

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Abstract

In Japan, the problems of farming workforce ageing as well as lacking successors are getting serious rapidly. If this trend continues, the number of farmers is expected to decline further, Japanese agriculture itself is facing a great crisis. In order to alleviate these problems, make farmers realize stable management by securing profit is necessary.

In particular, it is rather difficult for small and medium-scale farmers or small and medium-sized enterprises, who are mainly engaged in open-field cultivation such as fruit trees, to secure a stable income. Because they should bear large costs of purchasing and maintaining farm machinery and equipment, as well as the labor cost of harvesting during the harvesting season, under an uncertain cultivation environment that is highly dependent on the weather. In this study, we propose a system of cultivation resource sharing and develop optimal cultivation plans based on resource sharing plans. The effectiveness and applicability of the system to improve farmers' profitability are also examined by numerical experiments.

Keywords
Open-Field Cultivation, Fruit Growers, Cultivation Planning, Resource Sharing

Biography
Kotomichi Matsuno is an Assistant Professor in Department of Business Design and Management in Graduate School of Creative Science and Engineering at Waseda University, Tokyo, Japan. He received his MD and PhD in Management Engineering from Waseda University, Japan, in 2012 and 2019, respectively. His research interests include operations management and strategy, such as supply chain management and coordination, risk management and performance evaluation, negotiation and supply chain contract. He is a member of the Japan Industrial Management Association, INFORMS and POMS.