



トウモロコシ栽培条件の最適化研究

Study of Optimizing Sweet Corn Cultivation Techniques with Quality Engineering

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In a series of agricultural experiments using quality engineering that started in 2008, field-grown sweet potatoes were studied for two years and greenhouse-grown shiitake mushrooms were studied for one year, but the produce was evaluated only at harvest and not while growing. In the present study, corn was cultivated in planter boxes in the early stage of growth (from seeds to seedlings) and then transplanted to ridges in a field under conditions set according to an L_{18} orthogonal array. Growth data such as height of seedlings and size of sprouts were measured in the field, and the MT system was used to diagnose the harvested corn by analyzing noise factors, control factors, and growth data during cultivation, using the number of kernels as the characteristic value. In addition, the cultivation conditions were optimized through parameter design. From the MT analysis and parameter design, while elucidating the optimal cultivation conditions it was possible to discover, to some extent, what parts of the plants to observe and when to observe them in deciding whether to thin the plants out or cultivate them intensively. It is expected that this evaluation method, using both the MT system and parameter design, will contribute greatly to the improvement of agricultural cultivation techniques.

Key words : experimental farm, Taguchi methods, MT system, T method, RT method, parameter design, S/N ratio

1. 研究の背景と目的

トウモロコシは、コメ、ムギと並ぶ3大穀物でありアメリカでは重要な主食の一つである。トウモロコシは、他殖性作物の風媒花であり、雄穂から飛散した花粉が雌穂に付着、受粉して子実を付ける。本

実験で栽培するスイートコーンは、トウモロコシのうちの甘みの高い甘味種に属す¹⁾。

筆者らは2008年より農業関係の実験を開始し、三つの研究発表を行った。ここで体験してきたことは、筆者らが今まで行ってきた機械的な技術研究とは、かなり様相が異なることである。すなわち、従来のパラメータ設計の形式をとったとしても、データ解析には新しい方法が必要となる。

そこで、シイタケ研究では、いわゆるSN比の省略と田口が言った精密累積法の応用を考えた。なぜ

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