Developing technology to utilize AM fungi to bring revolutionary changes to agriculture

Exploring the possibility of arbuscular mycorrhizal (AM) fungi as a substitute for finite fertilizer and its application on a global basis.

We are trying to clarify the mechanism of the symbiosis between AM fungi and plants based on the idea that we can reduce phosphorous fertilizer use by making use of the characteristics of AM fungi. Previous CREST research has provided insights into the molecular infrastructure that clarified the symbiosis mechanism. For example, a group at Osaka Prefecture University found that the factor activating AM fungi is strigolactones, a substance produced by plants.

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In the ACCEL project, we aim to develop the most suitable technology for utilizing AM fungi by bringing these findings to field-based research. We will sequence the genome of mycorrhizal fungi and perform field inoculation experiments to evaluate the efficacy of arbuscular mycorrhizal fungi in terms of the reduction of phosphorous fertilizer use. Based on these findings, we will develop a diagnostic technology for effective use of arbuscular mycorrhizal fungi.

The utilization of arbuscular mycorrhizal fungi and reduction of phosphorous fertilizer use will drastically change agriculture, contributing to solving the problems of food supply and demand which we must deal with on a global basis.