

Roles of plant culture in controlled ecological life support systems

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Plant growth and reproduction in space have recently been of greater concern as the possibility of realizing manned space flight over a long term increases. The feasibility of achieving long term manned space missions is dependent on plant culture systems (space farming systems) in the controlled ecological life support system (CELSS). Plants cultured in space farming systems will play important roles in food production, CO₂/O₂ conversion and water purification. Life support of crews in space is greatly dependent on the amounts of food, atmospheric O₂ and clean water produced by plants. Therefore, the space farming systems with scheduling of crop production, obtaining high yields with a rapid turnover rate, converting atmospheric CO₂ to O₂ and purifying water efficiently should be established with employing suitable plant species and varieties and precisely controlling environmental variables around plants grown at a high density in a limited space.