

# **Development of an improved ground-based prototype of space vegetable-producing facility**

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Based on the development of a ground-based prototype of space vegetable-producing facility, development of its improved prototype has been finished, so as to make its operating principle adapt to the space microgravity environment better. According to the developing experience of first-generation prototype of the space vegetable-producing facility and detailed demonstration and design of technique plan, its blueprint design and machining of related components, whole facility installment, debugging and trial operations were done. Its growing chamber contains a volume of about  $0.5\text{m}^3$  and a growing area of approximate  $0.5\text{m}^2$ ; the atmospheric environmental parameters in the growing chamber and water content in the growing media were totally and effectively controlled; lighting sources are the combinations of both red and blue light emitting diode(LED) . The following demonstrating results showed that the entire system design of the facility is reasonable and its operating principle can meet nearly the requirements of space microgravity environment. Therefore, our plant growing technique in space was advanced greatly, which laid an important foundation for next development of the space vegetable-producing facility to be tested and applied in space station.