

Background of the technology

We started researching various plants basing on the research experience of barley and hop.

Breeding and improvement of hop and barley varieties



Biotechnology

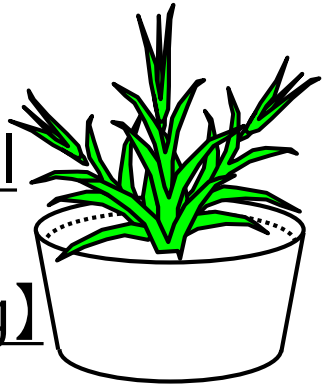


Development of technology for large-scale plant propagation

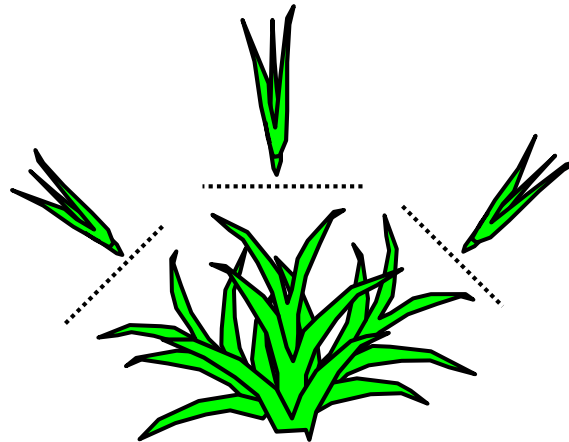
Overview of the technology

High-quality, uniform plant production requires the growth of plants with the same characteristics as the parent plant. This is usually achieved via "plant cutting".

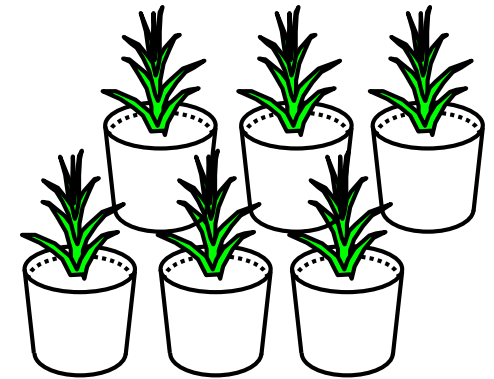
Conventional
method:
【plant cutting】



Parent plant



Placed one by one by hand••

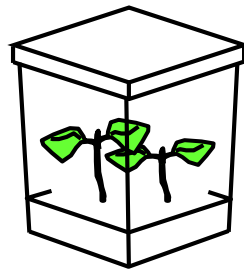


Same plant as
parent plant

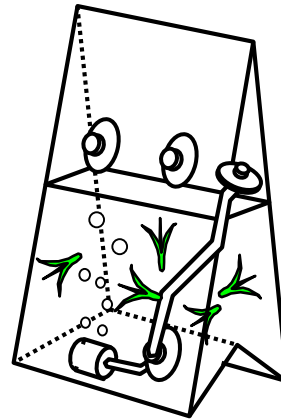
Characteristics of this technology (1)

“Our bag-based cultivation technology” is overwhelmingly more efficient than the use of “plant cuttings”

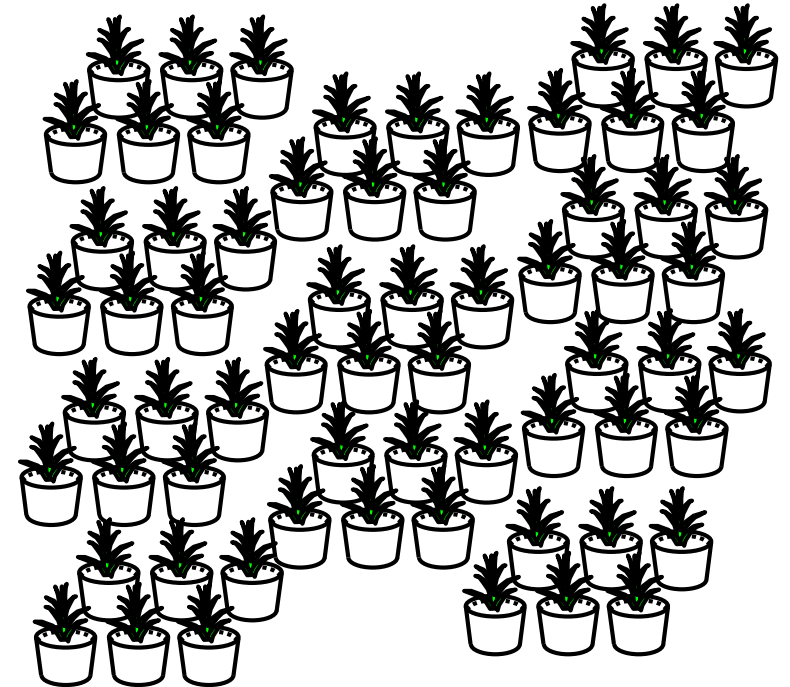
Kirin's unique
bag-based
cultivation
technology



Parent plant



Culture in liquid
inside unique bags



Same plant as parent plant

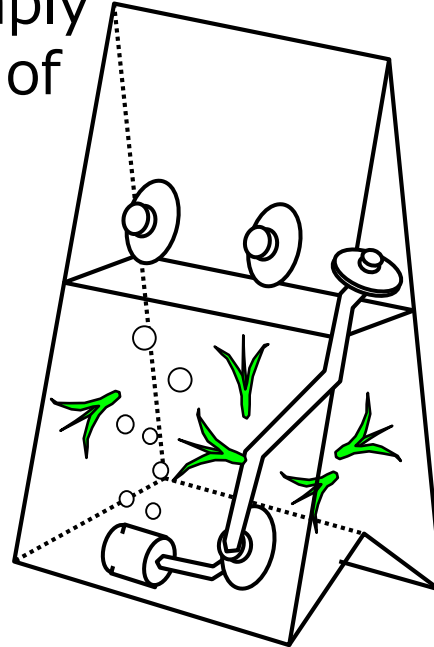
Characteristics of this technology (2)

Kirin's unique technology for growing plants inside bags has various distinguishing features

Production volume can be freely adjusted by simply changing the number of bags

Allows preserving sterility

Cheaper than tanks



Easy to work with

Small and easy to handle

Light and safe

Uses of this technology (1)

Mass production of carnations established the new business model for Mother's Day in Japan

Bag-based cultivation



- Small enough to hold in one hand
- Grow inside sterile bags
- Makes it easy to increase and adjust production by changing the number of bags

Transplantation in greenhouse



- Uniform, high-quality growth
- High survival rate

Just before shipping



- The flowering period is synchronized, allowing shipping by pallet

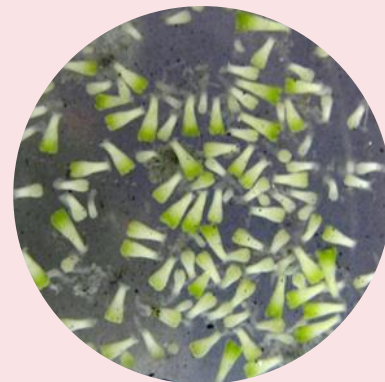
Uses of this technology (2)

High efficiency helped recover seaside protection forests affected by the earthquake

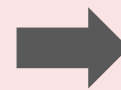
A seaside protection forest that was severely damaged by the Great East Japan Earthquake



Collection of pine cones



Disease-resistant black pine grown with bag-based cultivation technology



Seedlings



Seedlings for forestation

(Partner organizations: Forest Research and Management Organization, others)

Uses of this technology (3)

Also used in Japanese potato production/industry



New species of pests arrive from abroad
The rapid spread of resistant varieties is urgently needed



Providing technology to the Center for Seeds and Seedlings, NARO



Disease-resistant varieties
grown in sterile culture



Several hundred potatoes can be
harvested from just one container
numerous times each year



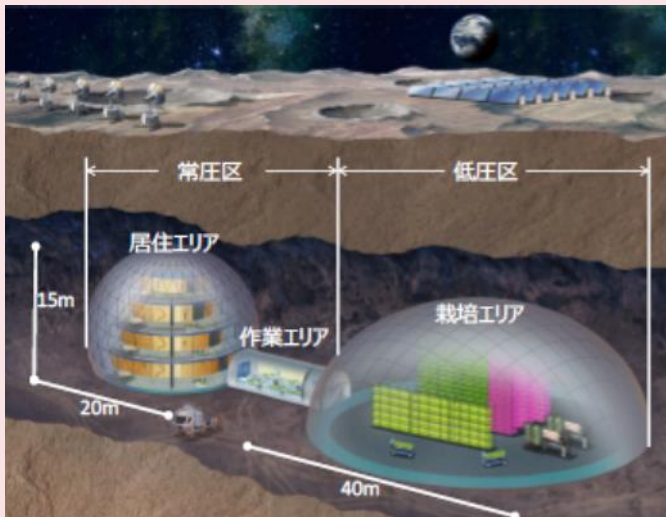
Very high productivity
(red-skin variety)

Future outlook

Use in various fields conducive to the solution of social issues is expected

- ➔ Growth of plant seedlings relating to resources and energy
- ➔ Seedlings of plants in tropical and subtropical plantations (greater seedling production efficiency, rapid spread of new varieties)
- ➔ Fields where innovative cultivation methods are needed (evolution from the plant cutting-based approach)

【Case study: considering use in a space farm】



- Expected to achieve plant growth in a unique environment (space) thanks to virus-free growth, high efficiency and small-lot production, among other features