

New Cultivars of *Cyclamen*, Kage-Yellow and Golden Boy

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My home town, Kurume City, is located in the southwest of Fukuoka Prefecture in Kyushu. Producers of *Cyclamen* in this city number 30.

In Japan, in recent years, production of *Cyclamen* has been gradually increasing with consumers wanting cheaper plants and larger flower colour choice.

To meet these trends in demand for new *Cyclamen*, our nursery set up a tissue culture laboratory and began a breeding project to develop new types of cyclamen. Now, we are very pleased to show our new elite cultivars, Kage-Yellow and Golden Boy, both with yellow flowers. Older cyclamen cultivars lacked yellow flowers. We succeeded in producing yellow-flower-colored types.

Outline of Breeding. Our breeding work started with finding yellow-flowered mutants among many seedlings of Kage's strain of 'Pure White'. The flower of 'Kage-Yellow' is medium-sized with a yellow colour at the bud stage and pale cream when open. Its colour becomes deep yellow at lower temperatures (around 15C) and under full sunlight. 'Golden Boy' is an improvement on 'Kage-Yellow' with deeper colour. We will be releasing a true yellow cultivar in the very near future.

Application of Plug-cell Stock Plant Production System for Orchidaceae Plants

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The common stock type of orchid is flask stock or CP stock. However, a low rate of plants are established during acclimatization. Improvement in the number of good plants acclimatized is important. Plug-cell stock production was tested as a means of improving acclimatization on *Phalaenopsis* flask plants grown from seed. Organic compost combined with a hydroponic culture system was most effective for the establishment of flask plants.

Application of Tissue Culture Technique in Nursery Stock Production of Fruit Trees

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Twenty years have passed since the tissue culture technique was introduced into nursery stock production on a commercial basis. It was somewhat of a fashion for nursery companies to adopt this new technique. But, at present, there are only a few companies producing plants on a profitable basis. Today, many businesses in

the nursery industry are finding it hard to maintain their economic viability. This paper presents the current status of Sanyo-Noen Nursery's micropropagation of virus-free understocks of fruit trees.

Sanyo-Noen Nursery set up a micropropagation laboratory in 1984. Since then, it has concentrated on the micropropagation of virus-free stocks of fruit trees. The major product of our company is grafting understocks for sweet cherry and peach. The understock plants are 'Dandy Chair' and 'Meteor' introduced from New Zealand. Both are useful dwarfing understock cultivars in Japan because they show good summer heat tolerance. Each year, 10,000 to 20,000 plants of both cultivars are produced by meristem culture. At present, a steady pace of production and sales is planned. However, there are still serious production problems remaining.

One problem is the need for improvement in the rate of acclimatization. The solution to this problem is to improve the quality of the young plants while in vitro. If good root production occurs in culture, young plants will establish freely at the acclimatisation stage. We have improved the soil in the acclimatisation bed, but there are several more modifications needed in the mixture ratio of composts.

Apart from fruit trees, another 30 flowering plants and vegetables are under study for their rapid mass production in tissue culture.

A second research area is the breeding of elite grape cultivars. The main target is to produce a seedless triploid cultivar. Several trial crosses have been made of diploid and tetraploid cultivars.

In summary, our company, Sanyo-Noen Nursery, utilizes micropropagation to produce fruit trees. However, the usage of micropropagated stocks is still only a small proportion of the production of such plants in Japan. Japanese agriculture will change dramatically in the near future and along with these changes, fruit tree understock production using micropropagation techniques will play an important role and be of great benefit in the future.

Large-Scale Production of Yama-udo (*Aralia cordata*) Using Adventitious Embryo Culture

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Today, natural foods such as Japanese native herbal vegetables are fashionable. Accompanying this trend, the more aromatic yama-udo (*Aralia cordata*) is more popular than the common udo. Propagation is done by seed rather than division because it requires less labour. However, seed stocks are variable in sprouting, growth, and quality. Several aspects of tissue culture of yama-udo were examined in an attempt to produce uniform stocks.

The application of 2,4-D at 1 mg litre⁻¹ was most effective for inducing adventitious embryos (induction frequency was 90%); BAP suppressed embryo formation.

Induction frequency was observed to be different between strains. Strain No.7 was the most prolific in embryo production. To save labour in isolating the small embryos, a simple protocol was established. This protocol involved mashing the