

Micropropagation of *Kalmia Latifolia* and the Use of Plant Growth Retardant for Pot-plant Production®

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Kalmia latifolia is a North America native flowering shrub species belonging to the Ericaceae. The production of this ornamental species in the Japanese nursery industry before the establishment of a tissue culture method was by the growth of seedlings. The flower color is pale pink but it has been improved through breeding. Garden cultivars with beautiful flowers are becoming popular. These cultivars are difficult to root from cuttings and while they are propagated by grafting in Japan this procedure is not efficient. Tissue culture propagation has allowed us to mass produce the better cultivars. We are using a tissue culture procedure to produce *Kalmia* and are applying a plant growth retardant for pot-plant production.

Mass Propagation by Tissue Culture. Tissue culture propagation of *K. latifolia* was carried out as follows. Vegetative shoot tips 1 to 2 cm in length from spring and summer shoots were excised and surface-sterilized with ethanol and sodium hypochlorite solutions. They were cultured on Woody Plant Medium containing 2 mg liter⁻¹ 2iP. These explanted shoot tips produced a couple of shoots which were subcultured for shoot multiplication. The multiplied shoots were removed from flasks and treated with IBA to induce root formation. They were transplanted into cell trays with 128 holes and acclimatized in a plastic film tunnel equipped with a mist sprayer. The rooting of *K. latifolia* takes 2 to 3 months and by 6 months after removal from the flasks, we were able to produce small plants.

Pot Culture and Treatment of Plant Growth Retardant. Pot plants using grafted plants are usually produced in 12-cm or 15-cm pots, but the tissue cultured small plants described above were transplanted to 9-cm pots and then were pruned during winter. The following spring they sprouted new shoots.

Kalmia latifolia does not initiate flower buds until the stock plants have matured. Even the plants produced by tissue culture do not have any flowers for 5 or 6 years. In order to sell flowering plants to market as soon as possible, we applied a plant growth retardant to promote flowering. The plant growth retardant, paclobutrazol (Trade Name: Bounty, 21.5% active ingredient), diluted 1000 times was sprayed on the selected pot plants to stop vegetative growth and promote initiation of flower buds. The spraying of plant growth retardant was carried out once in April-May or twice if the first did not stop vegetative growth. The plants started the initiation of flower buds in September (Fig.1).

Flowering and Sales. Flowering of *K. latifolia* started in early May of the following year. *Kalmia latifolia* is becoming popular as a new ornamental flowering pot plant in the Japanese market. The 9-cm pot plants we described here is a favorite especially in the Japanese urban house with a limited space (Fig. 2). It is also suited for massing in flower baskets. This is a promising new pot plant because of its quick sale during production.

We shipped cultivars to market when the flower buds colored. It is possible to control the timing of flowering in a heated greenhouse, however, some cultivars

needed a quantity of irradiation from ultraviolet light for changing the color of the flower buds. Our peak shipment was timed for Mother's Day (the second Sunday on May) and we found that the market value of this pot plant did not go down after Mother's Day but kept going well and had a good reputation.



Figure 1. Plants start the initiation of flower buds in September after growth retardant application.



Figure 2. A flowering plant of *Kalmia latifolia* in a 9-cm pot plants shown here is a favorite in the Japanese urban house.