

# The effects of gibberellic acid on the growth of Japanese cryptomeria and fortune paulownia

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One percent gibberellic acid aqueous solution, sprayed on 1-year-old Japanese cryptomeria seedlings and on half-month-old sprouts from rootstocks of fortune paulownia significantly increased growth of the main stems.

In the past, tree physiologists have investigated the effects of gibberellic acid (GA) on the growth of tree seedlings (1). In this experiment, I was trying to discover what were the effects of GA on the growth of Japanese cryptomeria (*Cryptomeria japonica* D. Don) and fortune paulownia (*Paulownia fortunei* Hemsl.). I was also concerned with the commercial value of this experiment.

## Materials and Methods

I used 1-year-old seedlings of Japanese cryptomeria which were grown in a greenhouse in Chi-Ton, Nan-Ton County, Taiwan. Seedlings were divided into four groups of 48 plants each. Each group was assigned to one of the following treatments: (1) control (2) one application of 1 percent GA solution (3) two applications of 1 percent GA solution (4) three applications of 1 percent GA solution.

The 1 percent GA solution was dissolved in distilled water containing 0.05 percent Tween 20. This GA solution was applied with an atomizer at the rate of 4 ml per seedling. The first application was carried out on October 21, 1974. The second application was made ten days later. The

third and final application was made ten days after the second.

Similar experiments were carried out with half-month-old sprouts from rootstocks of fortune paulownia. The experiment was carried out in a field at Ta-Chiao-Chi, I-lan County, Taiwan, during the period of April 16, 1975, to June 4, 1975.

## Results and Discussion

GA promoted the growth of the main stems of both species. This was statistically significant at 0.05 level (figures 1 and 2). Increasing the number of sprays did not increase significantly the main stem growth. GA also stimulated the flowering of Japanese cryptomeria. Microstrobili appeared in March 1975, 4 months after the GA application and megastrobili appeared in June 1975, 6 months after the spraying of GA solution.

Whether the treatment of GA to seedlings of Japanese cryptomeria has practical or commercial value is still uncertain. The treated plants must be observed over a longer period.

Fortune paulownia is a rapid growing and short rotation tree. Its timber has a very high market value. Young seedlings of fortune paulownia are easily killed by weeds, fungi, and abnormal climatic variation. After they have attained a growth of 50 cm, the seedlings are safe from these dangers. Since GA can promote seedling growth, shorten the danger period, and does not produce morphogenetic changes, this technique proves to have practical value for the culture of fortune

paulownia. The main commercial drawback of widespread use of this technique is the high price of GA. Reduction of the price would encourage widespread use of this technique.

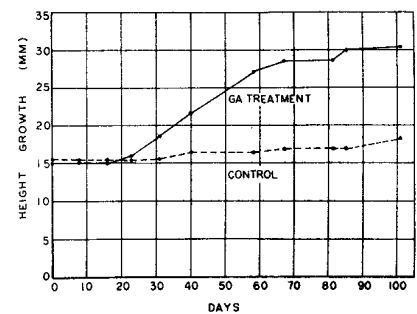


Figure 1.—Height growth of Japanese cryptomeria after one application of 1 percent gibberellic acid.

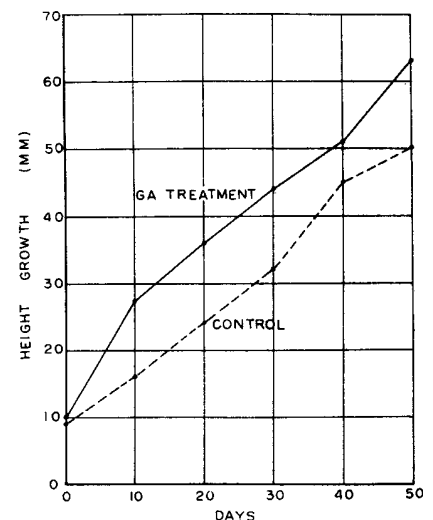


Figure 2.—Height growth of fortune paulownia after one application of 1-percent gibberellic acid.

## Literature Cited

1. Jensen, K. F. and L. S. Dochinger  
1972. Gibberellic acid and height growth of white pine seedlings For. Sci. 18: 196-197.