

The Production of Roots by Cuttings of Annual Plants Under the Influence of Indole-Butyric Acid

Harry J. Fuller and John H. Hanley

University of Illinois, Urbana, Illinois

Numerous experiments have been performed upon root production in cuttings of herbaceous and woody perennials after treatment with indole-butyric acid. Few experiments, however, have been carried out concerning the action of this acid upon root production in cuttings of annual plants, which normally do not produce roots from cuttings or produce roots in such small quantities that vegetative propagation of such plants by florists is impossible. The authors have placed cuttings of the following plants in solutions of various concentrations of indole-butyric acid to study possible effects on root formation: dwarf bush bean, Alaska pea, sweet pea, marigold, annual forget-me-not, didiscus, calendula, cineraria, and African strawflower (*Helipterum roseum*). The source of indole-butyric acid employed was a commercial preparation known as "Auxilin," manufactured by the Pennsylvania Chemical Corporation.

The cuttings of the various species were placed in the solutions made by adding definite quantities of the acid to portions of dechlorinated tap water, for periods of 6 hours, 12 hours, 18 hours, 24 hours, and 36 hours. After these periods of partial immersion, the cuttings were placed in well-washed moist sand in flats, and were observed from time to time for root production. In most cases where the treatment was effective, root production began about 6 to 8 days after treatment.

None of the species used produced roots after 6 hours treatment. After the 12-hour treatment, the forget-me-not and bean cuttings produced a few roots, but in no case did the roots appear in sufficient numbers to support the continued growth of the cutting. The 18- and 24-hour treatments resulted in the production inside of 9 days of numerous, fast-growing roots in the cuttings of bean, cineraria, African straw-flower, forget-me-not, marigold, and calendula. There was no apparent difference in the results of the 18- and 24-hour treatments. The 36-hour treatment resulted in extensive rotting. No roots were produced at any time in any of the treatments in cuttings of sweet pea, Alaska pea, and didiscus. Figures 1 and 2 show the appearance of treated and untreated cuttings of bean, marigold, and forget-me-not after 14 days growth in moist sand.

The concentrations of indole-butyric acid employed were $\frac{1}{2}$, 2, 4, 6, 8, and 10 mg per 100 cc of water. The $\frac{1}{2}$ mg concentration was ineffective in root production, the 2 mg. concentration induced moderate root formation in the bean, forget-me-not, and marigold, but none in the other species. The 4 mg. concentration was most effective in those species mentioned above in which root formation occurred. With higher concentrations of the indole-butyric acid, the tendency toward rotting increased, although some root production did occur.

The results may be summarized as follows:

1. Rapid rooting of cuttings of calendula, marigold, forget-me-not, cineraria, bean, and African straw-flower may be induced after treatment with indole-butyric acid.
2. The optimum time of treatment is 18-24 hours.
3. The optimum concentration is 4 mg. of indole-butyric acid per 100 cc. of water.

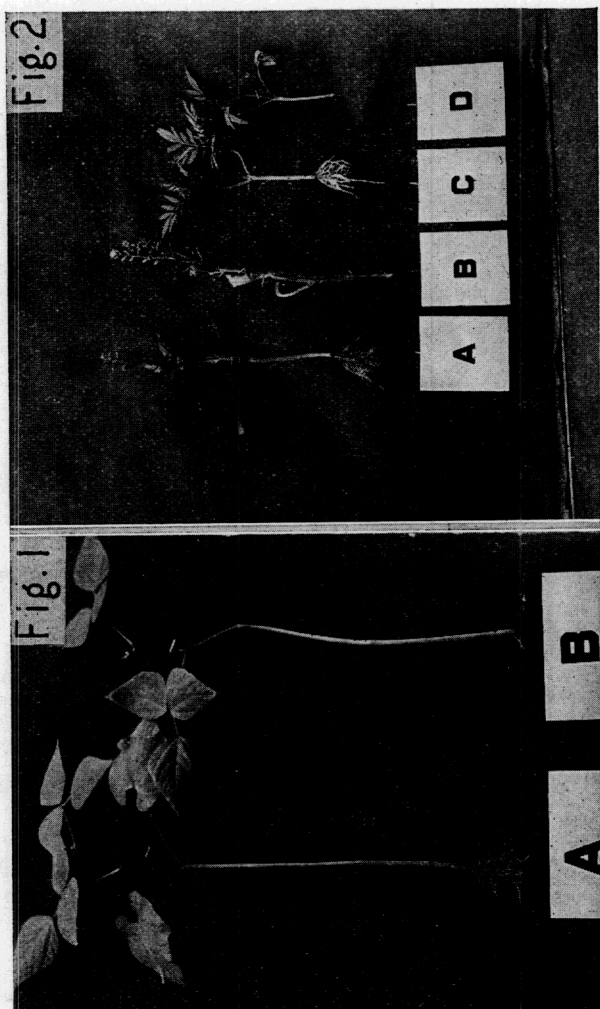


Fig. 1.—Beans: Treated cutting at left, untreated at right.
Fig. 2.—A and C: Treated forget-me-nots and marigolds.
B and D: Untreated forget-me-nots and marigolds.