

# Gibberellin on Flower Crops

studies made of response of some commercially grown flowers to applications of plant growth regulating chemical compound

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**Plants vary** in response to applications of gibberellins—plant growth regulating compounds—according to species, from great stem elongation or rapid flowering to no detectable reaction.

To study the effect of gibberellin on some commercially grown flowering plants, several species were selected for greenhouse tests.

A solution of distilled water and gibberellins at 100 ppm—parts per million—was applied externally to the apical growing regions of the test plant. The amount of gibberellins applied per treatment, the number of treatments, and the timing of the treatments varied, depending upon the plant species being studied. All plants were grown in a greenhouse with the night temperature at 60° F.

Bird-of-Paradise—*Strelitzia regina*—seedlings were treated with 50 micrograms of gibberellins at weekly intervals from May 23 to September 24, 1956. Although the stems of this species were not appreciably elongated, the leaf petioles were elongated on the younger leaves to 300% the normal petiole length.

Plants of *Hydrangea macrophylla*, which had not received temperatures below 60° F during the winter of 1955, were treated in the same manner as Bird-of-Paradise. The nontreated—check—hydrangea plant showed no more than 1" of stem elongation. Such a rosette type of growth is expected of plants which

have not received a low temperature treatment. The stems of the treated plants elongated appreciably. The leaves on the treated plants were smaller, lighter green, and attached to the stem at a more acute angle than normal. Flower buds were visible on the nontreated plants in September whereas the treated plants remained vegetative. Furthermore, where only one stem—on a plant which had several stems—was treated, the reaction to the gibberellin for both elongation and flowering was limited to the treated stem.

Column stocks—*Matthiola incana*—do not elongate or bloom unless night temperatures are lower than 60° F. Also, stem elongation and flowering are intimately connected, because they do not bloom without elongating. Massive applications of 100 micrograms of gibberellins applied weekly—through May and June—failed to cause either elongation or flowering of plants in the 60° F greenhouse where they would not ordinarily do so.

Gibberellins were applied to three flower crops which normally initiate flowers and bloom only when the nights are long—short-day plants. The gibberellin applications were made during the summer when nights were too short for flowering. These long-night plants included poinsettia—*Euphorbia pulcherrima*—*Chrysanthemum morifolium*, and *Kalanchoe Bolssfeldiana*. Applications of 10

and 20 micrograms—each in one milliliter of water—were made to the stem apices of these plants at daily intervals from July 11–24, 1956. Growth measurements were made before and after gibberellins were applied. When 20 micrograms were applied chrysanthemums elongated twice as much as the check, poinsettias elongated one and one half times as much and Kalanchoes elongated four times as much as the check. When 10 micrograms were applied the growth was one and two thirds times for chrysanthemums, two times for poinsettias and three and one fifth times for Kalanchoes over the control plants. The new growth of treated plants was light green, stretched, thin and weak.

The gibberellins did not hasten flowering of poinsettias and chrysanthemums. Kalanchoes were discarded before they flowered because of undesirable lank growth caused by the gibberellins.

*Cyclamen indicum* plants in California initiate flower buds throughout the spring and summer. However, these buds remain small and undeveloped during the summer and do not elongate and bloom until the season of cool weather.

On May 23 and for each week thereafter, a solution of gibberellins containing 100 micrograms per plant was applied to the crown of mature cyclamen plants which had been grown in a 60° F greenhouse. The plants at this time had many small flower buds. Treatment was discontinued on July 24. The treatment caused rapid flower development under the adverse summer environment.

The treatment shows promise of practical application for summer production of cyclamen pot plants. However, further study is necessary before gibberellin treatment can be a commercial practice.

Flowers of the treated cyclamen plants were not commercially desirable because they did not reflex fully. Also, the flower scapes of plants treated later in the year were excessively long and weak. A lesser amount of gibberellins or fewer applications might allow more normal flower formation.

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**Added gibberellins caused more rapid summer development of cyclamen flowers.**

