GROWTH REGULATORS FOR POT PLANTS

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Although a wide range of foliage plants are grown for house plant sale, only recently have specifications been drawn up indicating the factors to be considered in evaluating a plant for this purpose (6). The action and use of growth regulators on pot plants have been widely considered (1,3,7) and also tabulated for extension purposes (5). These regulators can assist in the production of desirable pot plants by manipulating the vegetative growth, inducing flowering, or a combination of both aspects.

Growth Retardants. Vegetative growth manipulation, especially height control, is achieved by the use of dwarf-inducing compounds. Desirable house plants should be relatively wide in relation to height; the most suitable height to diameter ratio is 1 to 1.62 (6). This is difficult to obtain without control in many pot plants due to the natural growth habit of the cultivar and the environmental conditions imposed on the plants; frequently several plants are placed in one container to rapidly produce a marketable product and the congestion of the plants in the container will induce shoot elongation. The selection of the appropriate growth regulator to produce a compact plant will be decided by the response of the species or cultivar to a particular chemical; *Hibiscus*, for example, responds to chlormequat but not to daminozide (3) while ancymidol, normally a very reactive compound, reduced the height of only certain cultivars of dahlias grown from tubers (2).

The persistence of the plant response and the ease of application — whether incorporated in the growing medium, applied as a drench to the medium, or applied as a spray to the foliage may determine which material is selected. In general, a higher concentration of material is required as a spray than if it is incorporated into the medium. When chlorphonium was originally used as a medium-incorporated material, it caused excessive dwarfing in chrysanthemums and was too persistent; more recent formulations appear to have overcome this problem and it is now an accepted compound to use in the medium for "pot mums".. Finally, it is essential that the product should produce no undesirable effects on flowers or foliage, consumers and producers both requiring an unblemished plant.

Induction of Flowering. In an efficient nursery producing a succession of crops, it is essential to time correctly the maturity and marketing date of specific plants. With those to be sold in flower, flowering time may be affected by many factors includ-

ing the maturity of the plants, (Kreb's "ripeness to flower"), temperature, daylength or natural flowering period.

The use of appropriate growth regulators can induce flowering in certain pot plants. The flowering of bromeliads, e.g. *Vriesia* and *Aechmea*, has been induced by the application to the central apex or "vase" of the plant of betahydroxyethylhydrazine (BOH) (10 mg per plant), and ethephon (250 ppm), while Goldie, at the Horticultural Research Centre, Levin, has dissolved acetylene gas in water and filled the "vases" twice at one week intervals with the solution. With these plants, it is essential that they have produced sufficient mature leaves; in addition, time to flowering is more rapid when applications are made in late spring or summer than in autumn or winter.

The application of gibberellic acid (GA_3) at 10 to 25 ppm to cyclamen includes rapid and simultaneous flowering, thus allowing the timing of the crop for a specific date, such as Mother's Day in New Zealand, or offering the possibility of extending the flowering season.

Finally, a good example of growth manipulation by a combination of cultural operations and the use of growth regulators has been shown in the production of *Bougainvillea* as a pot plant (4). This can be tabulated in relation to plant growth:

Growth Stage	**Treatment**	**Purpose**
Cuttings	Synthetic auxins	Root induction
Young plants	Pinching	Branch induction
Developing plants	Short days	Rapid prolific flowering
Maturing plants	Chlormequat or Ancymidol	Height control, flower induction
50% bracts opened	NAA to mature flowers	Flower retention

In addition to natural or synthetic auxins, the use of growth retardants can assist in planned production or the introduction of new plants which otherwise have undesirable qualities when evaluated as house plants.

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METHODS OF GRAFTING TAMARILLOS (TREE TOMATOES) (*CYPHOMANDRA BETACEA*)

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History. During 1964, experimental work was carried out at Plant Diseases Division, D.S.I.R., Auckland, on tomatoes. This involved grafting tomatoes on resistant rootstocks for nematode control. As a matter of private interest a few tamarillos were grafted. These few trees were later given to me to study their resistance to root-rot diseases in my tree nursery. The stock used for these trees were *Solanum aviculare* and *Solanum mauritianum*. These grafted plants were planted at random in my tamarillo plant nursery in the field.

During the following winter months disaster overtook this nursery block as 80 percent of the seedlings succumbed to *Phytophthora* root rot, owing to extremely wet soil conditions. The surprising result was that none of the grafted trees were effected.

On the strength of these results I was convinced that grafting tamarillo plants on these rootstocks would solve the *Phytophthora* problem. My property has a clay soil and 60" of rainfall per annum, where seedlings die after a few years of heavy cropping.

Propagation procedures.

Seed Collection. Two stocks were considered, namely *Solanum aviculare*, a native shrub growing in the bush in our area; secondly, *Solanum mauritianum*, a common treelike plant considered to be a noxious weed in the northern parts of New Zealand. Seed of both these species were readily available in our area.

Seed Sowing. Seeds are sown in August under glass in heated soil beds with emergence usually in about 4 weeks.

Potting of seedlings. Late October for *S. aviculare* and mid-November for *S. mauritianum* is when the seedlings are potted. Growth rate varies between the two species. All plants are potted into 5" plastic pots. Once the seedlings have been potted, they are placed in a shadehouse for growing on. One has to be careful not to use too much nitrogen in the potting mix as too rapid growth of the stock plants results in excessive