

# THE GROWTH REGULATOR "ATRINAL," AN AID TO MANAGEMENT

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Atrinal is a new plant growth regulator manufactured by Dr. R. Maag, A.G. Dielsdorf, Switzerland. Atrinal has demonstrated growth regulatory activity on many ornamentals, shrubs and top fruits. The compound is taken up through both leaves and roots, but foliar applications have provided the best results. Interesting responses include not only growth retardation, but also chemical pinching, induction of side-branching, improved rooting, fruit colouring, ripening and abscission, as well as yield increase depending on plant species involved.

Although Atrinal has demonstrated activity on a wide range of plants, in this paper the discussion is mainly restricted to its use as a plant growth regulator for the chemical pinching of azaleas, particularly the florist's azalea, *Indicum* hybrid cultivars, cultivars of White Water hybrids and Japanese evergreen azaleas.

The manufacturers claim the following characteristics and uses for Atrinal:

It is a new plant growth regulator with systemic activity for chemical pinching of azaleas and other ornamentals, the product being taken up through both leaves and roots.

If applied at adequate dosages, it stops development at the vegetative growing point and consequently induces axillary buds to develop. It can thus be substituted for mechanical pinching.

Atrinal is simple to apply, reliable, and saves labour.

Atrinal produces plants of superior quality, having more shoots and flower buds, and grows to a greater diameter.

Trials at the Horticultural Experimental Station, Guernsey and at F. Le Poidevin and Son, Azalea Specialist, Guernsey, have examined the above statements and results to-date support them. In addition, plants treated with Atrinal have reached a marketable stage in a shorter period of time than where other methods of stopping have been used.

Atrinal can be substituted for mechanical pinching. Apart from the first pinch, where it is desirable to form the basis of uniform, compact plants, by stopping growth mechanically, all subsequent pinching can normally be carried out chemically by the means of Atrinal applied when the new shoots are 5 to 8 cm. in length, and growing actively. It is essential that the chemical is applied before the flower buds have been induced.

The manufacturers recommendations for the timing of the last application is as follows:

late cultivars : end of March to early April  
mid-late cultivars : mid-April to early May  
early cultivars : mid May to the end of May

Late flowering cultivars, e.g. Road Runner, have been treated considerably later than the above recommendations, i.e. the end of May, and after being given a spray of B-nine in late July, had well advanced flower buds by late August. Further work needs to be carried out on timing which is obviously affected by cultivar; growing conditions and location.

Concerning the first growth stop, if Atrinal is applied to the young plants approximately 48 hours after pinching it increases the number of shoots produced by at least 25 per cent. This is extremely valuable as it forms the basis for a well furnished, high quality plant at an early stage. The cost is negligible.

The manufacturers recommendations for application are as follows:

The concentrations to apply under glass are:

from September to May : 2% Atrinal + 1% special wetting agent  
from June to August : 3% Atrinal + 1% special wetting agent

Note: The commercial product contains 200 g.a.i. of dikegulac-sodium.

A 2% solution of the proprietary product = 0.4% a.i. = 4000 ppm

A 3% solution of the proprietary product = 0.4% a.i. = 6000 ppm

“Special Wetting Agent”. This material is supplied with the Atrinal and contains 37.5 g per litre of alkylphenol oxyethylate. It is important to use only this special wetting agent when mixing Atrinal. The two concentrations above have been satisfactory on all the cultivars tested so far, although generally the 3% strength has given the best results in number of shoots and quality of plants produced, at slightly increased cost. Concentrations greater than 3% have tended to depress shoot yield and plant size.

A spray solution is easily prepared using ordinary water, whether hard or soft. The temperature of the water must not be higher than 30°C. The quantity of spray used will depend on the number, density and type of plants per square metre. Usually 1 litre of the spray solution will cover 4 to 5 sq. metres. The spray must be applied uniformly to run-off, wetting all parts of the plants.

Atrinal is most effective when applied at temperatures between 15° and 20°C. Lower temperatures than this prolong the growing period and higher temperatures encourage flower induction and thereby reduce the effectiveness of the Atrinal. The spray must be used on the day it is prepared. The plants should not be

watered for at least 24 hours after application to avoid washing off the spray. Atrinal should not be mixed with pesticides or foliar fertilizers. After Atrinal treatment, feeding should be discontinued until the lateral shoots develop.

When azaleas are treated with the appropriate dosage of Atrinal, elongation of the shoots is halted. From the second week onwards, the young leaves of the apex turn yellow and, on certain cultivars, also develop brown edges. With a few cultivars the leaves will turn a bronze/red colour and occasionally some minor necrosis of immature leaves occurs. These symptoms are confined to the shoot tips and are a prerequisite for the pinching effect. They do not prejudice subsequent development or appearance of the plants.

The lateral buds start to sprout actively about six weeks after application. Initially these developing shoots may also show slight chlorosis. In the following weeks this soon disappears and the leaves become a dark-green colour. The shoots develop rapidly to reach the next stage, i.e., a further pinching, flower induction treatment, etc.

If flower buds have been induced before Atrinal application or if the conditions are such e.g., high temperatures, that flowering is promoted, then the Atrinal effect is markedly delayed and frequently the flowers buds slowly develop at the expense of axillary shoots. When the shoots and leaves are eventually produced, the leaves are frequently lanceolate and the plants have a "bunched" appearance. This eventually disappears but the plants growth is markedly delayed compared with those plants which have been treated correctly.

Compared with hand-pinched plants, plants treated with Atrinal show somewhat delayed side-shooting, in our experience usually about two weeks. This is important if some plants or shoots of plants are stopped mechanically, to shape the plant, and subsequently sprayed with Atrinal. This can result in uneven shoot development and we have found it wise to delay stopping such plants a week to 10 days after applying Atrinal.

Although Atrinal still stimulates axillary branching and increases the number of shoots on the mechanically stopped plants, the removal of apical dominance by mechanically stopping promotes more rapid development of axillary shoots than on those plants which have received only Atrinal. Later on, however, this two week delay is largely made up, as subsequent applications of Atrinal takes place at an earlier stage of shoot development than is the case for mechanical pinching. More important, plants treated with Atrinal subsequently achieve a greater diameter due to improved side-branching, provided adequate space is given for the plants to develop.

In conclusion, in my opinion, the introduction of Atrinal is a marked development in the field of plant growth regulators. It achieves the claims made for it by its manufacturers. Used as recommended on azaleas it must be a considerable aid to management, not only reducing the labour requirement for pinching plants but also producing a given size marketable plant more quickly than mechanically pinched plants.

Atrinal is, however, still only in its early life of commercial use and because of this it is wise to treat it with the caution with which all new chemicals should be treated. Try it on a limited number of plants first, compare it with mechanically pinched, or with plants which have been pinched with other chemicals, before embarking on full scale application. There are a number of points which still require further clarification on the use of Atrinal on glasshouse azaleas, particularly the timing of applications in relation to different cultivars and the effects of different growing conditions on its performance.

Acknowledgements to: Rhys Phillips, Experiments Officer, Experimental design and statistics; Robert Clark, Management, Work measurement and costing; Judith Falla, Recorder, Recording and analysis; Roland Le Feuvre, Horticultural Technical, Crop culture.

Note: Atrinal, manufactured by Dr. R. Maag, A.g. Dielsdorf, Zurich, Switzerland has Ministry clearance for ornamentals only, NOT for edible crops.