

AZALEA PRODUCTION FOR THE FLORIST MARKET

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Azaleas for the florist market are usually acquired by one of three procedures:

1. *Growing on of large well-established potted or bed-grown liners.* Cultivars are usually selected from the Belgian Indicas, Rutherfordianas, Pericats or F₁ Hybrids.

2. *Purchase of hardy types in the fall* (usually Kurumes) but including some cultivars as mentioned in number one.

3. *Growing plants from cutting or liner stage to market size in a continuous year-round cycle.* Growers of this nature usually have cold storage facilities for breaking dormancy to allow for year-round flowering. They may force the plants into bloom themselves or sell in a budded stage for forcing.

My comments today will deal primarily with the third method. To grow plants on a year-round cycle and of a quality which is acceptable to the florist industry requires some additional equipment and investment compared to acquiring them by either of the other two methods mentioned.

Growing structures. To control temperatures so as to produce desirable vegetative growth and uniform budding, greenhouses must be available for fall and winter use. Uniform, desirable budding requires night temperatures of 65°F or more. In summer, night temperatures are consequently not much of a problem in some areas of the country. However, another problem arises in summer. The high heat and light intensity in some areas can adversely affect growth as well as foliage size and quality of plants. Therefore, a suitable greenhouse for growing azaleas year-round is one in which temperatures can be maintained at desirable levels in winter by heating and in summer by application of shade materials to provide reductions in temperature and extremely high light intensities. One other desirable characteristic would be facilities for providing supplemental lighting during fall and winter months when day lengths are less than 15 hours. It is also desirable to have raised benches, since disease problems, drainage, weed control and uniform heating are more easily accomplished on benches than at ground level. Another benefit of benches is the ease of pruning or pinching, fertilization, etc., as opposed to ground bed operations.

Fertilization. Azalea growth is greatly improved by the addition of nutrients through the irrigation water at regular intervals. A good program for us has been to use a water soluble

formula such as 21-7-7 or 30-10-10 analysis. The addition of 10 oz. or 8 oz., respectively, per gallon of concentrate to be used through a 1:100 injector will provide a nutrient solution of about 175 ppm N. Feeding should be done 2 out of 3 waterings in summer and 1 out of 2 in the winter. This schedule will not eliminate the need for adding basic amounts of fertilizer to soil mixtures. The constant fertilization will maintain the desired levels. An alternate method of fertilization would be to apply a long-lasting slow release form of fertilizer such as Osmocote® to the soil mixture and supplement with weekly or bi-weekly feedings through the irrigation system.

Soil mixes. Great success has been had in the past with pure peat as a growing medium. For economic reasons many growers now use mixtures containing high volumes of pine bark or other substitutes. We have had relatively good success with a mixture of 2 peat, 2 bark and 1 Birmingham slate with addition of a basic fertilizer as follows, per cubic yard:

2 lbs 12-6-6	4-6 lbs dolomitic lime
5 lbs Osmocote®	2 lbs. gypsum
4 oz minor element mix	

Any soil mixture should be porous enough to provide good drainage yet spongy enough to retain adequate moisture for the plant.

Disease and Insect Control. While many crops can be grown without occurrence of damaging insects and diseases, I believe some preventive measures are good. Usually the use of drenches containing Benlate® and Truban®, Benlate® and Dexon® or Banrot® applied at eight to ten week intervals will prevent any problems with *Cylindrocladium*, *Rhizoctonia*, *Pythium* or *Phytophthora*. A regular spray program applied at two week intervals using alternately Malathion, Diazinon or Sevin with either Thylate, Manzate or Dithane will usually control any other insect and disease pests. Morestan or Tedion will do a good job on any resistant mite infestation.

Watering. I would recommend applying water by means of overhead sprinklers. Higher humidity will be maintained in the growing area by use of sprinklers. Some additional benefits are obtained through foliar feeding if water-soluble fertilizers are used. Leaching of media can be easily accomplished if necessary. Some cooling effect occurs in summer during extremely hot and dry periods. It is wise not to keep foliage wet for long periods or not to water late in the afternoon since this can give rise to *Rhizoctonia* or leaf blights, algae growth, etc.

Growing Procedures. Liners should be grown or purchased that are in good vegetative growth when placed into the production cycle. Strive to maintain uniformity in size and bud-

ding of the finished plant. If plants are not in a good growing stage they must be allowed additional time in the production cycle until good vegetative growth is accomplished.

We usually start with growing-on liners of a 5 to 6 inch head size in 6 inch pots. The plants receive a pinch at this size. This is done by the use of a combination of hand pruning and chemical pinch using Off-Shoot-O®.

Off-Shoot-O® solutions are sprayed on the plant to pinch any soft growing shoots which will not be hand pruned. Exceptions to this are when plants have already formed flower buds. Chemical pinching is usually not effective then and the pinching must be done totally by hand or with shears. Effective concentrations of Off-Shoot-O® vary among cultivars and with time of year, temperature, drying conditions, age and maturity of shoot growth. Effective rates can range from as low as 4-5% concentrations to a high of 10%. After the chemical spraying, a good policy is to wait two or three days and then hand prune any irregular shoot growth. This will help prevent a recurrence of faster growth on the longer more mature shoots and lead to greater uniformity when the final pinch is made on the plants. It also provides a good opportunity to check the success of the chemical pinch.

At the time the head size of the plant is 5-6 inches the pot spacing should be on 12 × 12 centers. Eight weeks after the 5-6 inch size pinch a plant should have sufficient growth for another pinch. The head size should be 8-10 inches. The plant will be uniformly covered with new shoot growth if the previous pinch has been successful.

The plants are then in the optimum condition to receive a final pinch. This can be done with chemical pinching almost entirely if uniform vegetative growth has been achieved.

We allow 18 weeks following this final pinch to obtain a new flush of growth and budding of the plants. In winter and early spring, applications of B-Nine or other growth retardants are beneficial in controlling excessive shoot elongation while bud initiation is occurring. The application of retardants is made 6-8 weeks after the pinch. Usually shoot growth will be 1-1/2 to 2 inches long by then. Two applications of B-Nine at 0.25% concentration are usually required, applied one week apart. The most effective spraying can be done when foliage is dry, soil is moist and the humidity is high.

Environmental Effects. Due to several factors, bud formation can be adequate in less than 18 weeks, or may take longer. During periods of high light, bud initiation occurs at a faster rate. Higher light intensity and longer days also result in more multiple buds per shoot and more multiple flowers per bud.

Higher temperatures also encourage faster bud initiation and growth. Extremely high temperatures (90°F days) and excessive light intensity can cause adverse reactions, such as slower growth, smaller leaf size and generally less attractive plants, although bud formation during these periods is usually excellent. It is therefore desirable, if possible, to shade azaleas in high light and heat periods with 50 to 60% shade (3,000-4,000 foot candles) during the day. On the other hand, providing houses with good light penetration in winter is extremely important. Supplemental lighting of from 10 to 20 foot candles intensity and 2 to 4 hours duration to extend short day length is also desirable and is an actual necessity in northern areas and during dark and cloudy periods in the southeastern-most regions. Being able to condition plants during the last six or eight weeks of bud development by the use of blackcloth shading to provide short days would be desirable, but, in my opinion, is not imperative. I would also question the economics of the additional expense.

To grow and force azaleas to produce flower buds adequately is best accomplished when normal seasonal conditions are duplicated. This means simply: (1) duplicating late spring and early summer climatic conditions (warm long days, high light, mild nights) to initiate good growth; (2) duplicating summer conditions (hot long days, high light and warm nights) to initiate and complete bud formation and growth; (3) duplicating fall and winter conditions (cool shorter days, low light and cool or cold nights) to mature buds and break dormancy prior to forcing into bloom.

Cooling and storing azaleas with buds is done when visual examination determines that plants have buds. They can be mechanically cooled to break dormancy by providing 6 weeks of cooling in refrigerated storage at 45 to 50°F. Lighting for 12 hours/day with a minimum of 20 foot-candles is necessary to prevent foliage drop in the 45-50°F temperature storage. For natural cooling, plants can be held in a well-shaded greenhouse at temperatures ranging from just above freezing up to 50-60°F day temperatures for a minimum period of 10-12 weeks. This period depends on how many days and nights temperatures reach levels below 50°F. The accumulated effect must be approximately the same as 6 weeks at 50°F. Plants can be held in this greenhouse environment much longer than in cold storage. The limiting factor is usually the natural forcing which occurs with the warmer days of late winter and spring.