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Information

Camellias

The potential for sales of Camellias* has expanded. Their popularity in garden centres has led to a bigger demand for young liner material to "grow on". Camellias are also attractive to large stores who see them as pot plants for both indoor and outdoor use.

Until recently a typical camellia plant was single stemmed, but there is an increasing demand for quality branched plants, and the presence of flower buds is essential for sale. These demands prompted experimental work at Efford Experimental Horticulture Station. Their work resulted in an accelerated production schedule in which wall branched plants with flower buds are produced 2-2½ years after taking cuttings. Recommendations for camellia production given in this leaflet are based on that schedule.

* Mainly *Camellia japonica* cultivars, but also includes *C. reticulata, C. saluensis, C. Sasanqua* and hybrids, particularly *williamsii* crosses.

Propagation

Camellias produce two main flushes of growth in the year. The first occurs during April-June, the second around late July-August, the times depending on site and season. This enables two batches of cuttings to be taken each year.

1. In July, cuttings should be taken as the first flush of growth starts to ripen at the base. These summer cuttings need to be rooted under mist.
2. In the November-January period, cuttings should be taken when the second flush of growth has ripened. These cuttings can be rooted under mist, but propagation under a low plastic film tent, supported just above the cuttings in the propagation bed, reduces fuel costs and improves cutting quality. Plastic film can also be laid directly on top of the cuttings, though this makes regular inspection more difficult.

Type of Cutting

Ideally, terminal cuttings should be used since they produce plants which branch better and grow faster than those from leaf bud cuttings. The latter should only be used if supplies of cuttings are short, and an extra year may then have to be added to the production schedule.

Leaves on cuttings should not be trimmed as this provides an entry for disease, particularly *M. karstenii,* which is generally considered a "wound pathogen".

Rooting Hormones

Powders In summer, use Seradix No. 1 or No. 2; in winter, use Seradix No. 3.

Quick dips These normally give more consistent results than powders. The lower 5mm of each cutting should be held in the solution for 5 seconds. Two products have been used with success are:

1. Indole Butyric Acid (IBA) in 50 per cent acetone. IBA is obtained as a powder and, since it is relatively insoluble in water, needs dissolving in 100 per cent acetone before diluting to a 50 per cent solution with water.
   Concentrations for summer cuttings: 1,000 ppm* IBA (up to 2,000 ppm for difficult rooting varieties, e.g. Francie L.)
   Concentrations for winter cuttings: 2,500 ppm IBA.
2. Synergol (50 per cent IBA, 50 per cent NAA). This proprietary liquid dip has given promising results in trials at similar concentrations to IBA.

*ppm = parts per million (or milligrammes/litre)

Rooting Media and Temperature

75 per cent peat, 25 per cent lime free grit,
50 per cent peat, 50 per cent perlite,
50 per cent peat, 50 per cent fine, pine bark — These have all been used satisfactorily.

The incorporation of long-term, slow release fertilisers in the rooting medium has, in trials, given improved establishment and early growth; for example, Ficote 14:14:14 or 16:10:10 (140 day formulations) used at rates of 1kg/m^3 (in summer, under mist) or 0.75 kg/m^3 (in winter, under plastic film).

Shading is important during bright weather. With temperature of 15°C in the rooting media, good results have been obtained with a range of varieties, though in some seasons 18°C can improve speed of rooting.

Disease Control

Routine hygiene measures in the propagation bed are essential. Regular removal of dropped leaves is important as they provide a prime site for fungal inoculum.

All cuttings under propagation, but especially the winter cuttings under plastic film, should be sprayed at fortnightly intervals.

Liner Stages

Summer rooted cuttings are potted in October/November of the same year. Winter rooted cuttings are not potted until June/July of the following year.

Compost for Liners

Open peat/bark mix	
Magnesian limestone	1.2 kg/m^3
PG mix	1 kg/m^3
PLUS	
Osmocote 18:11:10	0.75 kg/m^3
OR	
Ficote 14:14:14 (70 days)	2.0 kg/m^3
OR	
Ficote 16:10:10 (140 days)	
OR	3.0 kg/m^3
Ficote 14:14:14 (140 days)	

The choice between the last three fertilisers will depend upon the time the plants are to be held in 90mm pots - the longer-term Ficote being more suitable where plants are to be held in these pots for more than six months.

Over Wintering

Glasshouses provide a better environment for over wintering young liners than plastic film tunnels where humidity is higher and risk of disease is increased. If heating can be provided to give frost protection, over wintering is improved.

In a tunnel, improved frost protection is afforded by a "double skinned" cover. If the fan needed to separate the two films is sited within the tunnel and draws air from the funnel, then humidity is reduced - condensation occurring mainly in the gap between the films.

During the winter, root growth of liners in frost-free greenhouses remains active, and by spring, roots will permeate the pot. The liners can be potted on into 130mm pots as soon as buds start to grow. On the South Coast this is late February/March; elsewhere it may be as late as April.

FIRST SEASON'S GROWTH

Pot size

A size of 130mm is suitable for liners of direct potting of cuttings struck in November which have rooted by April and can be potted by early May (cuttings not rooted by this date need handling as liners).

Compost

Open Peat/Bark mix	
Magnesian limestone	1.2 kg/m^3
PG mix	1 kg/m^3
PLUS	
Osmocote 18:11:10	1.5 kg/m^3
(omitting single superhphosphate)	
OR	
Ficote 14:14:14 (70)	3.0 kg/m^3
OR	
Ficote 14:14:14 (140)	
OR	4.0 kg/m^3
Ficote 16:10:10 (140)	

Plant population:	36 pots/m^3
Protection:	grow under glass or in tunnels with frost protection if possible.
Shading:	required during high light.
Irrigation:	low level or "pot-drip" systems are preferable to overhead irrigation.

The main objective in the first full season of growth is to product plants with a good branch framework, on which flower buds can develop in the second season. The ideal plant has 3-4 strong shoots, but there are differences in branching between varieties - some are very "shy". With these, a single bud becomes dominant and the plant maintains its single-stem characteristic.

Hand or chemical stopping can improve branching, though not all plants within the batch will respond.

Stopping (standard method)

A "stop" into unripe wood (by hand), early in the first flush of growth, produces the best early framework with 2-4 branches arising from near the base of the plant.

If stopping is delayed until the winter when the wood is ripe, more variable branching is obtained, with fewer and weaker branches at the base. If left a year before stopping, plants will be "leggy", since the eventual branching will occur near the crown rather than at the base.

SECOND SEASON'S GROWTH

The aim in the second season is to promote the development of flower buds and produce an attractive plant for sale in the autumn or the following spring. Plants usually remain in the 130mm pot, but are spaced out to give a population of 27 pots/m^2. Budding has been improved by the following regimes:

Temperatures

Under natural conditions, flower initiation occurs during May-July when long days, high light intensities and high temperatures combine.

High temperature will increase flower bud development, but is costly. Recommended temperatures, if heating is available, are as follows.

In April, a 15.5°C minimum night temperature should be maintained until the buds are obviously floral. This will encourage autumn flowering of some varieties. When buds are obviously floral remove heat and grow at ambient temperatures, to ensure correct flower development and to avoid bud drop.

If higher temperatures are imposed on some varieties in May (instead of April), flowering may be delayed until the following spring.

While increased temperatures have proved one of the more important factors in improving budding, the economics are dubious in view of the budding response obtained under cold glass with the cultural aspects detailed below.

Fertilisers

Applications of nitrogen and phosphate fertilisers are vital in promoting bud development. Liquid feeding has proved more effective in the second year than slow release fertilisers, but it is important that it is stopped in early August. Liquid feeding after August may lead to accumulation of salts and bud drop.

An irrigation regime, drier than that used in the first season, will also encourage the development of flower buds.

Three Options For Fertilisers In The Second Season

April			May-August	
A.	Where remaining in same pot:			
	Apply single superphosphate	3g/130mm pot	Liquid feed: apply 200 ppm N, 100ppm K_2O through the irrigation lines. *OR* Apply 400 ppm N, 200 ppm K_2O each week at a rate f 100 ml/130mm pot	
	OR			
B.	Where potting on using a slow release fertiliser	*Base/m^3 .of peat*		
	Magnesian limestone	1.2 kg		
	PG Mix	1.0 kg		
	Osmocote 18:10:10 (or Ficote 14:14:14 (70) at 3.0 kg/m^3)	1.5 kg		
	OR			
C.	Potting on using a liquid feed Programme		Liquid feed as above Stock solution: 44g potassium nitrate	
	Magnesian limestone	1.2 kg	+ 98g ammonium nitrate, dissolved in 1 litre water	
	Fritted trace elements WM255	0.3 kg		
	Single superphosphate	1.5 kg	Dilute 1:200	200 ppm N, 100 ppm K_2O
			Dilute 1:100	400 ppm N, 200 ppm K_2O

Growth Regulation

Chemical growth regulants have improved bud initiation in trials and should be applied in early June and again in early July, for example, chlormequat drench - 3,000 ppm at a rate of 100 ml/130mm pot. The benefits of using growth regulants may only be seen in poorer budding seasons.

Varieties

Choice of the correct variety can make the work to induce branching and flower bud development much easier.