



**Figure 4.** Schematic diagram of a microwave sterilisation technique.

both the speed and the efficiency of the process. The application of the microwave technique to other pasteurization or sterilisation processes should not be ignored.

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### **GROWING CLEMATIS JACKMANII HYBRIDS**

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Except for the higher areas away from the coast, clematis plants do not usually grow really well around Sydney, Australia. The climate during late summer is very humid. Often considerable rain is experienced; such weather is conducive to phytophthora development. However, if the planting site is

carefully selected and the roots kept cool by placing flat stones or rocks on the soil surface over the root area some degree of success can be obtained.

It is worthwhile to note that although clematis can be difficult to grow and provides few problems, lucrative markets for this beautiful flowered climber are available in the Mountain and Tablelands areas of New South Wales as well as for interstate shipments.

To be successful in growing clematis hybrids a programme of sanitation must be employed to eliminate disease rather than trying to arrest it after the cutting material or plants have been affected. Such a programme must start before the cuttings are taken from the mother plants. Common sense and regular attention to sanitation are essential requisites for success.

### MATERIALS

Cutting material was obtained from the Southern Tablelands and brought to Sydney in an insulated van — a journey of approximately 7 hours. When material is kept in plastic bags it remains turgid for at least 3 days, even the flowers remaining fresh.

The mother plants were sprayed once a week from the time the foliage appeared until one week prior to collecting cutting material. They were sprayed with captan (2 oz.) and Benlate (¼ oz.) + 1 tsp. wetting agent, in 100 litres of water.

We also believe that the leaves are more prone to drop if the cuttings are sprayed after they are severed from the mother plants and processed into cuttings.

### METHODS

Time for making cuttings was in the spring, from September until mid-November. The green wood was considered suitable as soon as it began to firm and reach the stage when it would snap without bending. The material was cut in the early morning while the dew was still on it — before sunrise.

Cuttings are made with two nodes, having prominent buds which ensure good growth and development. The cuttings, 7 to 12 cm in length, are severed 7 mm below the bottom node; the lower leaves are removed and the top leaves halved.

Cuttings are treated with a 5 sec quick-dip of 0.4% IBA, and community planted in 175 mm squat pots, 25 cuttings to a pot.

Fifty mm pea gravel is washed and sterilized and placed in the bottom of the pots for extra drainage to a depth of 14

mm. The remainder of the pot is filled with a mix of 2 parts German peat to 3 parts screened coarse washed river sand.

The cuttings are dipped in the IBA solution to a depth of 7 mm and inserted in pots and placed in a glasshouse with bottom heat set at 21°C. Intermittent mist is employed with a Jeffrey's Weatherwatch, which misted approximately every 8 to 10 minutes during the hot part of the day, for about 10 seconds. At that time of the year the temperature fluctuated between 20° to 25°C. Callus formed in 3 to 4 weeks and roots were initiated from 6 weeks on.

No dead leaves or material was removed from the pot surface and some browning off occurred. This did not prove a deterrent as once the buds burst they continued to make growth. At 7 weeks the cuttings were taken from the glasshouse and placed in a shadehouse for a further 10 days and given a syringe of water during the hottest part of the day.

Although the strike rate was only 70%, it was noted that the top section of some cuttings died although the lower nodes under the surface remained healthy; having been repotted into propagation mix at various times, they produced shoots which proved to us the value of double-noded cuttings.

Cuttings were then potted into 75 mm tubes with John Innes soil mix and placed in a shadehouse of 65% shade cloth. The young plants made rapid growth, and in January were repotted in 150 mm pots and staked.

Some plants bloomed and were sold in the autumn, but the bulk of the crop was wintered over in the shadehouse until spring. They were then top dressed with sand, and hoof and horn meal which promoted rapid growth, enabling the plant to reach the top of the 50 cm stake in a few weeks; most terminated with a beautiful flower 7 to 17 cm across, according to the cultivar.

One experiment used was to make the cuttings at the site where the mother plants were grown, process, bundle and wrap them in wet newspapers then place them in plastic bags for transportation. This proved quite successful.

It was noted that a dressing of 3 year old chicken manure applied to mother plants during late autumn was beneficial and produced strong vigorous growth and superior flowers.

The inclusion of coarse ash to our sawdust mix improved drainage and aeration.

Ingredients for composting sawdust were: 60 cu. yd sawdust, 15 cu. yd pinebark, and 15 cu. yd coarse ash

Fertilizers added were:

Single superphosphate	23 Kg.	Iron sulfate	12 Kg.
Sulphate of potash	46 Kg.	Urea (46 %N)	140 Kg.
Gypsum	60 Kg.	Agra magnesium, 95%	30 Kg.
Esminel	12 Kg.		

### CONCLUSION

Rooted cuttings of *Clematic jackmanii* hybrids may be grown in the Sydney, Australia metropolitan area up to marketing sizes providing care is taken with all steps of the procedure mentioned and particular attention is given to the timing of taking cuttings and subsequent handling of the rooted cuttings.

### POPLAR BREEDING

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Poplars have been grown in many widely different regions of the world since very early times, especially in the East and Far East. In Europe, when the North American poplars were introduced and hybridized with the European poplars, the expansion of poplar cultivation really began.

In Australia the early settlers introduced several species, growing them mainly as ornamental trees. Only very few clones were known: two clones of *Populus alba*; the Lombardy poplar, or *P. nigra* ‘Italica.’ (the best known poplar of them all); the Yunnan poplar, *P. yunnanensis*; and the American cottonwood, *P. deltoides*. There are no native poplars in Australia nor in the Southern Hemisphere. All poplars growing in southern Africa, South America, and New Zealand are introduced or manipulated clones. In the 1940s some of the so-called “Schreiner hybrids” were introduced. They are known as Androscoggin poplar, Geneva poplar, Oxford poplar, and Rochester poplar. They are hybrids between species of the section AIGEIROS and TACAMAHACA, and are grown in Australia mainly as ornamentals. A little later the introduction of the well-known Italian hybrid-clones I-154, I-214, I-488 and a few others occurred to add some poplar clones which could be of interest to the wood-producing industry. In the late 1950s the match companies decided to grow their own raw-material: poplar wood for making match splints locally. It was near Grafton, N.S.W. where the first plantation for growing match wood was established. This interest in poplars stimulated the research work already underway in the Botany Department of the A.N.U. Under the direction of Prof. L.D. Pryor, work on the introduction of semi-evergreenness into cottonwoods was already in progress and, besides species and provenance intro-