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## Australian Region Celebrated Its 25th Anniversary

The Australian Region of the I.P.P.S. celebrated its 25th Anniversary at this Conference. The first technical session was a reflection by a group of our founding members on 25 years of plant propagation developments and how they have helped my business. It was a privilege to listen to some of the history of our Society recounted by these elder statesmen who have been inspirational mentors to many of the current membership.

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## Fogging and Misting

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### INTRODUCTION

The importance of water to a plant is self evident to all of us who live and work in the Plant Kingdom. This importance is multiplied a thousand fold when cuttings are taken and we expect them to root. With leafy and softwood cuttings it is critical that we maintain an atmosphere supercharged with moisture to keep the cuttings in a turgid condition. By using mist and fog to hold humidity at desired levels a modern plant nursery maintains cuttings in a turgid condition to prevent wilting. This enhances rooting.

What is the history and background to our use of fog and mist? In preparing this paper I found in Volume 1 of the I.P.P.S. Proceedings from 1951, 46 years ago, a paper presented by Professor L.C. Chadwick of Ohio State University titled *Controlling Humidification as an Aid to Vegetative Propagation*. From the way this paper reads mist as a tool in propagation was still new in commercial applications but had been used in research at Ohio State. The paper outlines systems available at that time. The first commercial application is outlined by James S. Wells in his book *Plant Propagation Practices* published in 1955. He also outlines early work at Rutgers and Michigan State as well as Ohio State Universities.

The first mention of fog in commercial use in I.P.P.S. Proceedings is in Volume 8 in 1958 and was titled *The Propagation of Softwood Cuttings in a Fog House* by E. Stroombeck of Warner Nursery, Ohio. In this paper he mentions seeing a fogging device which he found in use in Holland in 1957. This machine had been designed for industrial purposes. Before these advances a predominance of cuttings were hardwood taken when the plants were dormant. They were often covered with bell jars or grown in Dutch lights. The advent of mist and fog saw a surge in the range of plants grown through the use of softwood cuttings.

Therefore there is little need to address the benefits of fog and/or mist. There are many technical papers in the I.P.P.S. Proceedings already. These are case histories of the day-to-day experiences of propagators with specific plants. They are an invaluable resource.

Our own experiences may be of some interest. Our first propagation some 40 years ago was carried out in darkened sections of a shadehouse on a bench which was unheated. We planted only in summer. Cuttings were sprayed by hand each hour on the hour on a hot day. Some trays of small cuttings were planted in deep trays which were covered with clear glass. What a step forward it was when we purchased our first mist unit. It ran on a balance arm which, when it dried, rose and turned the control on. Some of these are still in use in the industry today. We now run several separate propagation units in our business. Each endeavours to supply a specific microclimate for the crops grown therein. We classify them as:

- 1) Simple outdoor misting
- 2) Misting in a glasshouse
- 3) Fogging in a greenhouse
- 4) Planting without the use of mist or fog
- 5) Misting as an aid to grafting

I will outline to you the uses of each system and how they have helped in our business over the last 40 years.

## THE SYSTEMS AND HOW THEY WORK

**Simple Outdoor Misting.** This is carried out on crops such as *Rhododendron* (azalea) and *Camellia*. Mist lines are mounted on wire benches which are about 70 cm from the ground and under 50% woven shade cloth. Mist is applied through simple jets at 50/60 psi. Summer propagation is carried out in January, February, and March. Rooting occurs in 4 to 6 weeks for azaleas and 6 to 8 weeks for camellias. No bottom heat is used. Mist is controlled by time clocks. With large areas under propagation we use time clocks for our on/off control in all mist applications.

**Misting in a Glasshouse.** Misting in a glasshouse is used for year-round production of a wide range of our crops. Most shrubs including *Mandevilla*, *Grevillea*, daisies, and perennials grown from cuttings are placed on benches under which hot water is circulated to hold our bottom heat regime between 20C and 23C. This system is controlled by thermostats. Mist lines are suspended above the crop well above head height. Mist pressure is held at 50/60 psi. Rooting varies depending on the crop in question. It can be as little as 4 to 6 days for some crops and as much as 12 weeks at some times of year for some slow-to-root plants like *Rhaphiolepis*.

**Fogging in a Greenhouse.** Our fog area is controlled by a humidistat coming on when the humidity drops below 78% and going off when it reaches 84%. Benches are constructed similarly to those in our glasshouse mist areas with bottom heat supplied in the same way at similar temperatures. Fog pressure is held at 600 psi. Crops which really like our fog conditions include all indoor foliage crops we grow and several selected shrubs which through experience we find produce better results in this environment. We also use our fog house for transfer of tissue-cultured plant material from Stage 3 tissue culture vessels and for the rooting of microcuttings (Stage 2 tissue culture). A range of ferns, foliage, and shrubs are treated in this way with good transfer results. We have very little loss. We have also discovered that very good germination of palm seed occurs in our fog house so whenever there are any spare benches, trays of seed are placed on the heated benches to germinate.



### **Propagation Without the Use of Fog or Mist on Bottom Heat**

When the spring and summer temperatures take away the chill of winter there are some crops that will root satisfactorily when placed on wire benches under a glass roof to keep off heavy rains. A covering of perforated plastic or marex cloth often helps retain moisture in the cuttings. We use this system for some plants such as some *Metrosideros*, *Kalanchoe*, *Hedera*, and other easy-to-root plant material.

**Misting as an Aid to Grafting.** It is only in recent times that we have begun to graft to any marked degree. This is our second season. Preliminary results seem to show a marked improvement in the number of grafts that take under intermittent mist lines. The area used is in a high shed with the mist lines mounted under the roof line. The mist is controlled by time clocks. The crop grafted is azaleas using a simple side graft. The graft is placed on the top of the plant, tied in place and then we cover it with a clear plastic sandwich bag tied off around the stem. After 3 weeks the tie is removed to allow some air to circulate around the graft but still keeping it protected from heavy rain. Another 3 weeks and we remove the bag entirely. One can see clearly the graft union has taken and the scion is growing away.

### **CONCLUSION**

All in all we take the facilities we have in propagation houses of today for granted. We do not realise that the advances in simple things like mist and fog houses are of recent times. Because the system is so simple we tend to accept that we now have the best and cheapest way to root our cuttings.

A lot of on-the-spot observation suggests that better results can be achieved with a strict regimen in moving cuttings off once rooting commences. Mist, after rooting is achieved, is detrimental to the new plant establishing quickly. Listings of a range of crops with optimum misting times tied together with other rooting aids would be of great benefit to propagators. All of us have some knowledge in this regard. I see a benefit to all members and the Society in establishing a register as a data bank. All members of the Society could contribute some inputs to give us all a clear guideline for all the crops that we grow.