

Fog or Mist – Where to Use[©]

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OUR HISTORY

Our family has owned and operated Aspley Nursery since 1951. We have operated retail, wholesale, and export nurseries from five sites over the years (Fig. 1). We undertook landscape contracting many years ago as well. The remaining wholesale nurseries are now based on two modern intensively developed sites of about seven hectares.

Dad taught us from an early age to always innovate! This was started in the days where we

- Grew our plants in tins cans.
- Used John Innes mixes.
- Irrigation by hand or with skinner lines.



Fig. 1. Nursery number two in the mid 1960s.

Some of the early new plants dad brought or assisted in developing for the Queensland market included:

- Azalea.
- *Sansevieria*.

And in association with George Trapnell, he propagated a host of other native plants which George discovered including:

- *Callistemon* ‘Rose Opal’, ‘Dawson River Weeper’, ‘Luster Creek’, and many others.

- *Melaleuca bracteata* ‘Revolution Green’.
- My dad was always an innovator and we were amongst the first to use:
- Bottom heat for propagation.
- Steam sterilization.
- Assisted in the development of plastic pots with Vic Levey (IPPS member) and Queensland Plastics in the 1960s.
- Mist propagation.
- Chlorobromination of irrigation water.
- NIASA Accreditation.

WHY USE FOG OR MIST

Managing the Environment

Particularly during propagation, we need to supply as precisely as possible:

- Light.
- Water.
- Nutrition.
- Temperature control.
- Media air.
- Hygiene.

It is the matrix of these factors and more which ensures we optimize our efforts to produce healthy plants.

Water

We need to apply water to:

- Provide this essential element for growth.
- Maintain relative humidity.
- Cool the environment.

The Difference between Fog and Mist

Both fog and mist fulfill the points raised before, however there are significant differences.

Droplet Size

- Mist: 70-100 μm .
- Fog: 10-50 μm .

Cooling Potential

Both will cool the environment through evaporation, however as droplet sizes reduce, the surface area of the droplets changes logarithmically. Halving the droplet size equates to an eight fold increase in surface area. By reducing this another quarter, this equates to a 64 times increase in surface area. This huge increase in surface area dramatically changes the cooling potential. Fog cools and humidifies far more than mist.

Water Supply

The water pressures used in the two systems are quite different.

- Mist 50-60 psi (1 psi = 6.9 kilopascals approximately).
- Fog Up to 1000 psi.

The filtering for a fog system needs to be much finer, to ensure no blockage occurs. The plumbing needs to be much more robust to allow for the higher pressures. The costs for fog can be significantly higher for installation, but is very dependant on the facility.

Why Change to Fog

Some of the issues to consider if a change to fog is considered include:

- Saturates the complete structure, so corrosion and hygiene of the complete area is

required

- Lowers the temperatures more quickly
- Increases relative humidity more quickly
- Cleaner water required
- Increase plumbing cost potentially
- Better plumbing and likely better maintenance
- Different considerations for venting of the structure

It is very important that you remember each propagation facility is unique. Factors again to consider include:

- External environment.
- Structure.
- Containers pots, cells, etc.
- Media.
- Propogule.
- Management.
- Integration into the end use.

Again, it is a matrix of these factors and more which ensures we optimize our efforts to produce healthy plants.

Our Fog and Mist Houses

Our houses are:

- Relatively simple plastic covered igloos.
- One mist house.
- One fog house.
- Concrete paths.
- Stainless steel benches with a central roller bench.
- Fan ventilated and thermostatic controlled.
- Bottom heated with hot water at 22-25°C.

Water

- A blend of pure bore water and town supply.
- Chlorinated water from a storage tank using a cheap pool float system and calcium hypochlorite tablets.

Media

- Perlite and peat.

Pots

- Plastic tubes mainly.
- Cells.

Many other pot systems have been trialed including:

- Jiffy[®].
- Peat pots.
- Coco pots.
- Paper pots.

Again because of our overall system in the nursery, these other systems were rejected.

Our Mist System

- A very conventional design (Figs. 2 and 3).
- Mist lines suspended above the benches with drains under to stop drips.
- Conventional mist nozzles.
- Mist controller measuring the suns radiation to initiate start.
- Mist duration by an adjustable timer with the norm being 7 sec in summer.

Remember each propagation facility is unique!



Fig. 2. Our mist system off.



Fig. 3. Our mist system on.

Our Fog House

This fog system is not a conventional system (Fig. 4). Designed and installed at least 20 years ago in association with the DPI and SEQEB. (State government departments for horticulture and electricity.) Its features include:

- Water pressure of 130 psi.
- Standard plumbing.
- Fog lines suspended above the benches with drains under.
- Standard mist nozzles with slightly enlarged jets.
- Particle sizes range from fog to mist.

Unlike many fog systems, we hardly need to add supplementary water.

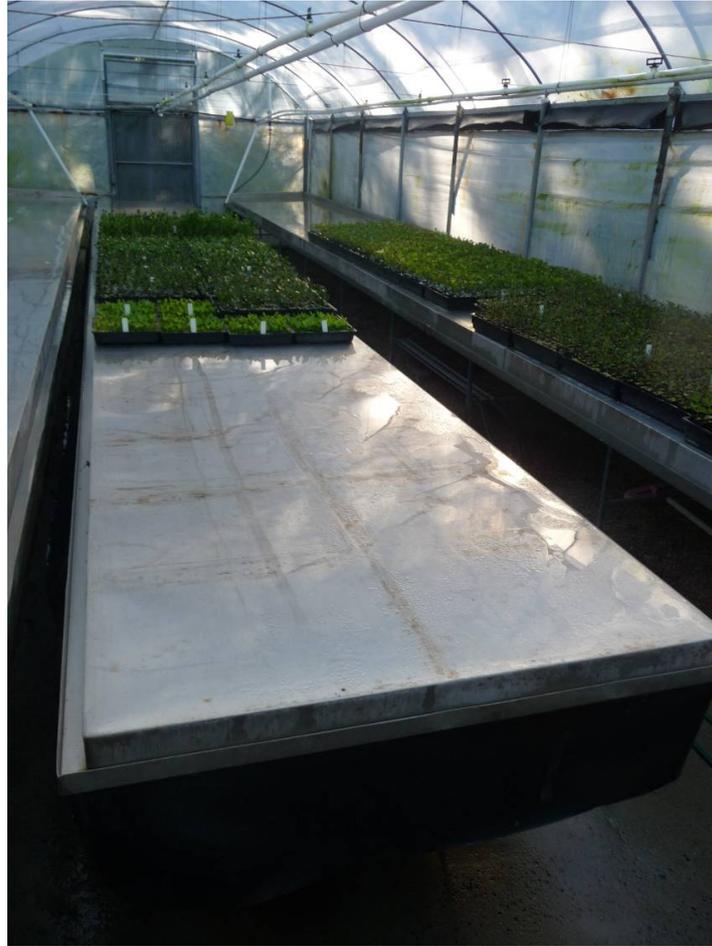


Fig. 4. Suspended fog lines and a central roller bench.



Fig. 5. Enlarged mist nozzles and conventional plumbing at 130 psi.

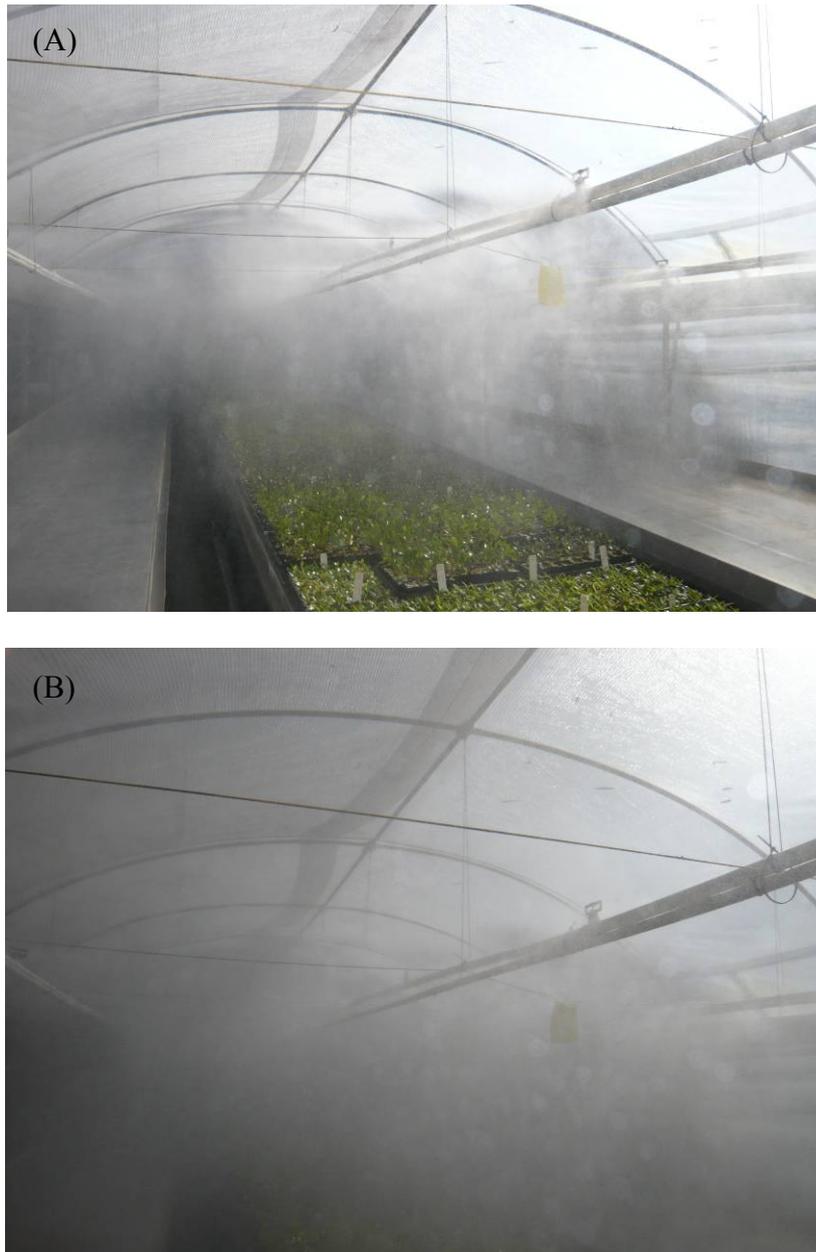


Fig. 6. The fog in action (A and B).

Which Plants Prefer Fog or Mist? (Remember each propagation facility is unique!)

1. Mist.

- Fine leafed plants
 - *Baeckea*
 - *Callistemon*
 - *Westringia*
- *Rhododendron* (azalea types)
- *Tibouchina*
- Tissue culture plantlets

2. Fog.

- Broader leafed plants
 - *Camellia*
 - *Gardenia*

- *Murraya*
- *Syzygium*

Deciding on What to Use?

All systems have their good and bad points. Again, it is a matrix of the following factors and more, which ensures we optimize our efforts to produce healthy plants which integrate well into the overall nursery system. You should consider:

- What is your external environment?
- What structure are you to use?
- What can you afford?
- What pot and media are to be used?
- What level of hygiene do you expect to maintain?
- On going labour is a large cost, so consider materials handling.
- What product are you expecting to produce?

IDEAS

As I said earlier, my dad always told us to innovate and these are some ideas to consider which we use in our propagation houses: module galvanized frame (Fig. 7), stainless-steel benches (Fig. 8), single run low pressure poly pipe in steel channels (Fig. 9), water proof grease to stop pests climbing (Fig. 10), and our newer system to drain the benches (Fig. 11).



Fig. 7. Module galvanized frame using high density foam for insulation and support.



Fig. 8. Stainless-steel benches with side gutters, and plastic side curtains.



Fig. 9. Single run low pressure poly pipe in steel channels. Spray foam to locate pipe with the bench siting atop.

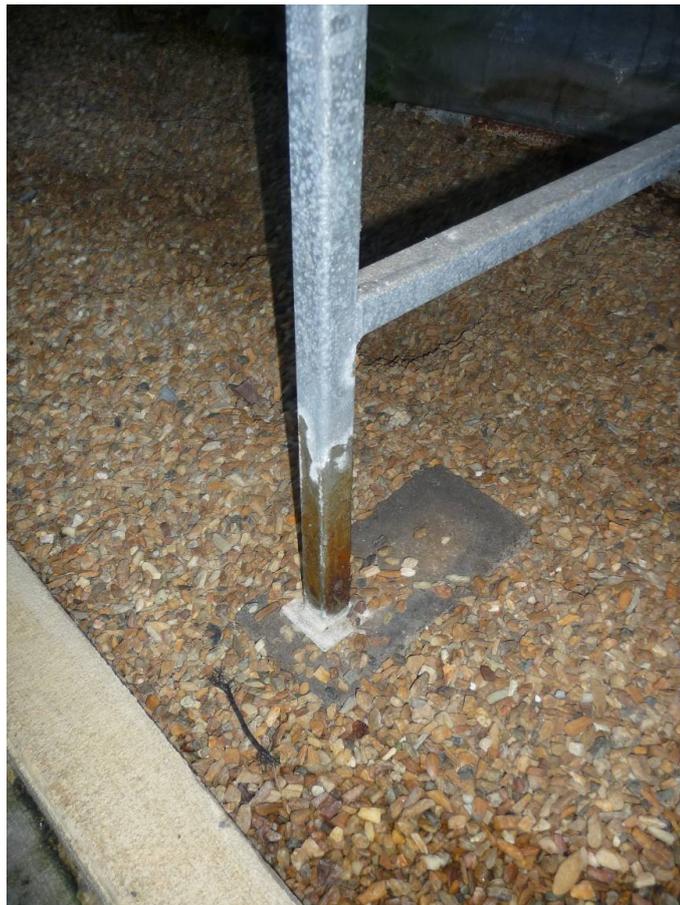


Fig. 10. Water proof grease to stop pests climbing.



Fig. 11. Our newer system to drain the benches.

THANKS

I have to thank my parents for the chance to be involved in the nursery industry and my brother for his support in allowing me to attend IPPS conferences.

I have been trained by many propagators we employed over the years, but in particular Trevor Klump in the old old days and more recently Dot Muller (ex IPPS member) who was trained by Vic Levey (IPPS member).

I have to also thank the incredible members of IPPS, who have not only openly shared their wealth of knowledge at conferences and their businesses, but in the wonderful resource developed in the Black Book. I am proud to be one of you!