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OUR WAY WITH FOG PROPAGATION OF TISSUE-CULTURED PLANTS

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For many years I have advocated the propagation and growing on of plants using fog as opposed to mist. The advantages I saw as an engineer and operator of a tissue culture lab were many. Although the initial cost of the first unit is a little high, subsequent units are comparatively cheap.

Our experience in the lab and with growing on plants out of flask was such that they required a high humidity but no great water application.

What was it we required?:

i) Control of transpiration and evaporation during propagation, and initial planting out of tissue-cultured plants.
ii) Application of chemicals to plants after establishment — foliar feeds, fungicides, insecticides, or any other crop enhancing water soluble chemicals.
iii) No over-wetting of growing media.
iv) Frost protection during winter.

Considerations:

Safety — we were conscious of the need to have no extreme high pressure lines for water. Many systems in use here and overseas use up to 500 psi water pressure and correspondingly piping and installation can be expensive when lasting qualities are considered, e.g. stainless steel or copper lines. Filtration of water in high pressure units is expensive and involves considerable maintenance.

The system involves the use of a small air compressor and receiver delivering up to 6 cfm. This will allow up to 6 units to be run off the compressor. Each nozzle is controlled by an indicating Martonair 25/5 solenoid valve for air and water so that there is no dripping or air escape when not in use. Water is controlled by a Martonair flow control, and air with a Norgren regulator and gauge.

How does the system fit into the plant propagation scene?

We all know that a zero transpiration loss is required and desirable for good propagation. This ideally must be achieved with minimum overwetting or leaching of the growing media. These factors can only be achieved by use of "fog", and with proper control, transpiration losses can be eliminated completely without overwetting of soil or growing media. The value of this is that plants can be guaranteed sufficient oxygen for roots, with no loss of moisture through leaves.

Relative humidity at 100% will assure zero transpiration loss and this will maintain a light mist of liquid on plant leaves — not enough to precipitate to droplets, but sufficient to ensure that good growth conditions are obtained. So by maintaining a light fog around plants, the plant leaves will be slightly wet so that leaf surfaces will always be slightly warmer than the surrounding area. This is also good for foliar feeding, either high nitrogen (30-10-10 or 40-1-1) to force rooted cuttings or plantlets, or a 10-30-20 for promotion of root growth, the rates of application being 1:600 to 1:1000. All foliar feeds must include trace elements. Weekly application of fungicide can also be applied in this way.

Fog density can be controlled by several means: —

1. Number of nozzles
2. Water volume
3. Air pressure

In a propagation house, the ventilation can be reduced to 25%, as fog is the cooling medium. Air is introduced at a rate of 1 cfm per nozzle, so air changes are being affected regularly.

The proper use of fog is accompanied by a visible and dramatic increase in plant production, but remember fog is not mist. Fog must not be sprayed directly onto plants and precautions must be taken to prevent this. With our system, there is no danger of nozzles producing water drops or flow onto valuable plants. It can be said that the fog will travel up to 5 to 7 metres from nozzles. Also it must be remembered that fog does not irrigate your plants. Trays stay the same as when put in fogging areas, so preparation of trays for cuttings, etc. is of great importance. Potting mix with minimal fertiliser is required if foliar feeding is used.

Finally, several pluses: —

With pest control all surfaces of the plants are reached by fog, not just upper leaf surfaces. In a cost conscious, energy conserving society, fans can only be required to go 50% of the time. In winter, fog acts as a frost preventative — ever seen a frost on a cloudy night? Fog reflects back heat from heaters, so saving energy. Fog on leaves in frost will produce latent heat

on plant leaves as it condenses on plants.

Nozzles in our units are supplied by Spraying Systems Co. of USA and are type ¼ in. with integral filters.

The compressor was run on a time clock from 8 a.m. to 4 p.m. daily; solenoids are set from main control console where interval of 5 minutes and duration 60 seconds of fog was set for daytime. It was found that we required fog at night, 60 seconds every 1 hour.

Two nozzles can maintain fog in a 60 × 20 ft. house, but a more satisfactory operation would be obtained from four nozzles.

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A SHORT HISTORY OF THE PRIMROSE AND POLYANTHUS

TERRY C. HATCH

Pukekohe, R.D. 2

> *"And in the wood where you and I upon faint primrose beds were want to lie".*

Did I say a short history? Mention of these plants goes back to the earliest herbals, and "Will" Shakespeare uses them in botanical ramblings throughout his works. I can only manage a scant 40 years love affair with them. Collecting flowers and plants as a small child, the wonder of finding clumps of softest yellow flowers nestling in the long grass beneath hazel coppices and that delicious fragrance: — still eagerly awaited every spring. "Will" mentions the cowslip and oxlip too.

Hands up, those of you who do not know where the bee sucks?

And of the oxlip — "I know a bank where the wild thyme blows, where oxlip and the nodding violet grows quite overcanopied with luscious woodbine, with sweet musk rose and with eglantine".

Primula vulgaris [syn. *P. acaulis*]	Primrose
Primula vulgaris 'Rubra'	Primrose (Asia Minor)
Primula veris	Cowslip
Primula elatior	Oxlip

Are these the parents of the modern-day gaudy polyanthus