

Low Pressure Fogging

Vince Van Sant

Netafim P/L, PO Box 2186, MALAGA WA 6944

INTRODUCTION

Propagation is a very specialised area of growing plants. During this stage it is critical to have the right balance between temperature and moisture in the propagation medium. In climates with high temperature and low humidity, the propagator needs to take care in choosing equipment which will maintain optimum environmental conditions around the propagation bench. Some of the systems which apply and control moisture will be addressed in this paper.

OPTIMUM CONDITIONS FOR PROPAGATION

The optimum conditions during plant propagation will depend on plant species and type of cuttings used. During the first few days it is important not to stress the cuttings. Most stress will occur through evaporation of moisture from the tissue of the cuttings. This will occur when air temperature is too high and/or humidity too low. In the first few days the cuttings cannot transport moisture from the medium to the upper parts of the plant. It is important to keep humidity around the cuttings at 70% to 80% and the air temperature between 23 and 28C.

The right propagation mix needs to be selected to achieve the correct balance between air and water in the medium.

MISTERS

The most common method of water application to a propagating bench is by misters. Most misters operate at a pressure between 150 and 250 kpa. The flow rate per mister is between 20 to 40 litres h⁻¹. The misters are usually placed at 1-m spacing above the propagation bench. A good mister gives a fine droplet which will land on the cuttings, the evaporation of the droplets will give a cooling effect to the cuttings. Most evaporation will take place during the time that the misters are on, i.e., there is little residual effect. This can create a problem on a hot dry day when the misters are on more often, as the system struggles to maintain set temperature and humidity levels. A proportion of the water applied as mist will land on the propagation medium, if application exceeds evaporation from the medium saturation will occur and the cuttings may rot.

FOGGING SYSTEMS

More and more propagators are looking at fogging systems for propagation. This system does not give droplets but a fine fog. Air with low moisture levels will absorb fine fog very easily and humidity is increased very quickly. Most fogging systems operate at very high pressure (sometimes more than 3000 kpa). This high pressure requires copper or steel piping throughout the propagation area. Some systems even require air compressors to further pressurise the system.

LOW-PRESSURE FOGGERS

In contrast to conventional fogging systems, a low-pressure system works with a recommended operating pressure of 400 kpa (e.g., Dan FoggersTM). All components

are manufactured of high quality plastic. The foggers and fittings are designed in such a way that they are easily installed and changed. Foggers can be pushed onto the fittings and pulled off by hand, no additional tools are required. There are various nozzles with different flow rates available and these are usually colour coded for ease of recognition.

Installation is very simple as the fogger nozzles can be installed by pushing the barb fitting directly into polypipe. The recommended nozzle spacing is one per 1 to 1.5 m². The recommended operating pressure of 400 kpa will give an average droplet size of 100 µm. Although 100 µm may not be a real “fog” — it is a good and cost-effective alternative to the high pressure systems. It provides perfect conditions for plant propagation by humidifying the air and also assisting with cooling of the propagation house.

A leakage prevention device can also be installed. This device prevents water dripping through the fogging nozzles onto the plants when the system is not in operation. It will keep the system under pressure which allows a simultaneous startup of all foggers when switched on.

CONCLUSION

With the cost very similar to a conventional misting system and performance close to that of a high-pressure fogging the system, the low-pressure fogging system is a very good alternative to apply moisture to a propagation bench. It also provides an ideal solution for cooling and humidifying production greenhouses.