

Economical Low Pressure Fog System

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INTRODUCTION

The objective of creating a low-pressure fog system is to achieve an ideal rooting environment in which plant evapotranspiration is minimized without saturating the rooting medium.

DISCUSSION

By combining fog and intermittent mist, a decrease in misting is realized due to the humidity contribution of the fog. The fogging system being presented utilizes compressed air (35 to 55 psi) supplied at the nozzle orifice to shear the water droplets as they emerge.

Fog systems that supplement intermittent mist have been shown to:

- Boost percentages of difficult-to-root cultivars.
- Reduce nutrient leaching from foliage.
- Reduce carbonate and iron residue on foliage.

Low-pressure fog systems have several advantages, such as:

- Considerably less expensive than high pressure systems.
- Nozzle maintenance is reduced.
- Safer operating systems.

SYSTEM DESIGN

The rooting chamber at D&B Plants consists of a 32 ft × 98 ft × 12 ft gutter-connect bay, in which approximately 400,000 cuttings are rooted in five or six rotations. Materials used in the construction of the rooting chamber as shown in Table 1.

Two small vents on the north wall and an exhaust fan on the south wall operate at 85°F and 92°F, respectively. There is no shading provided on the double poly structure.

Four Spraying Systems nozzles #SP-1180.JPG (Figure 1) are 12 ft off the ground and supplied with well water at 45 to 60 psi. A 6-hp air compressor is located outside the greenhouse and serves as an air station for the nursery.

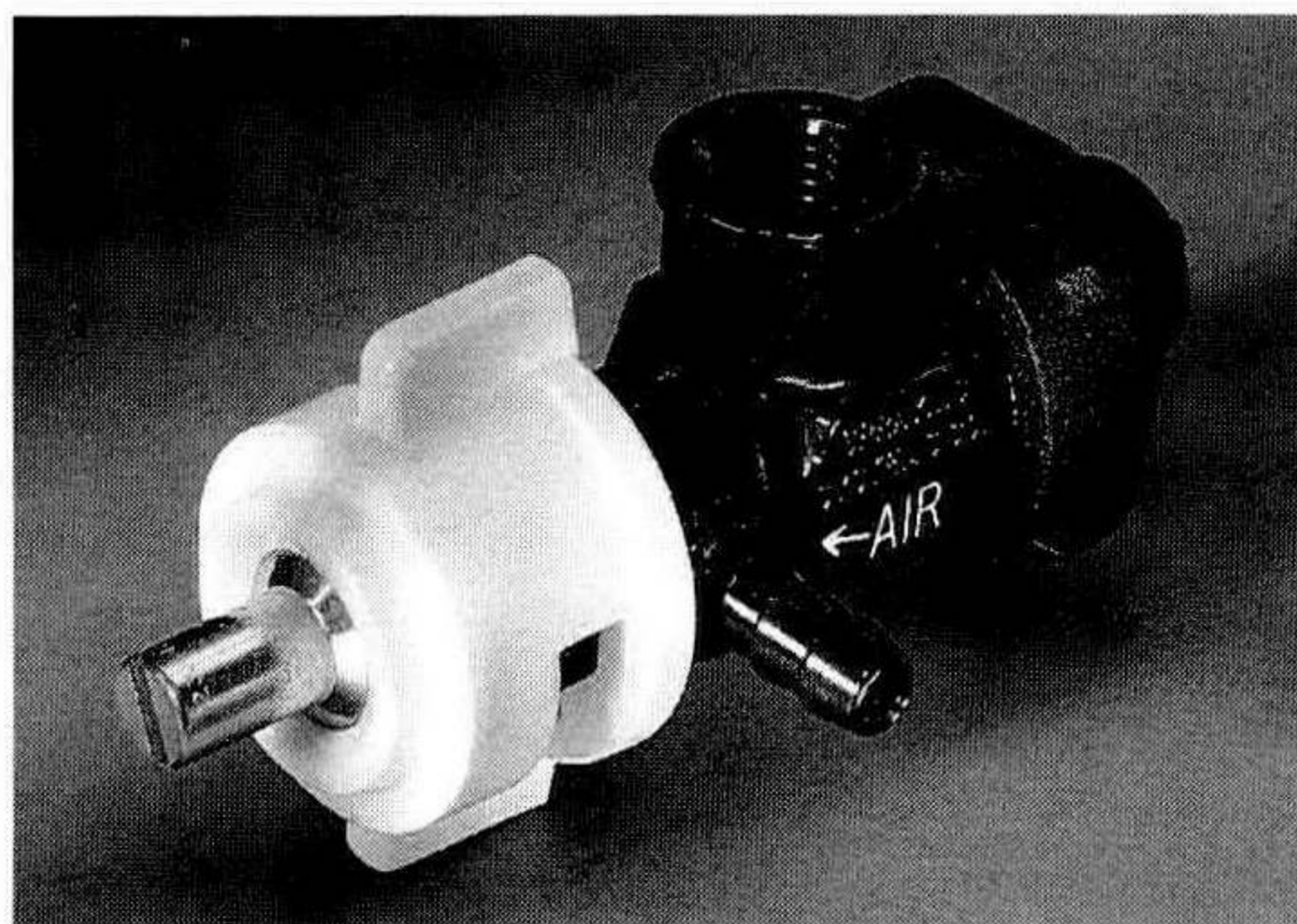


Figure 1. Nozzle from Spraying Systems #SP-1180.JPG. Contact 1-800-95-SPRAY or www.spray.com

Table 1. Materials used in construction of the rooting chamber.

Spraying Systems nozzle #SP-1180.JPG	4 @ \$38.00	\$152.00
PVC pipe/fittings	\$35.00	
Copper pipe/fittings	\$45.00	\$165.00
Solenoid valves (4)	\$85.00	
Recycled mist control unit	\$00.00	
(Suggested) 24-h timer and 60-min time clock		\$150.00
6-hp air compressor		<u>\$600.00</u>
Total		\$1,067.00

RESULTS

After 3 years of operation several concerns and advantages are apparent.

Concerns:

- Increased pressure on the water supply is needed to eliminate back feed. Water pressure must be greater than air pressure.
- Low-pressure fog requires a dedicated water and air system to ensure proper function. Other prolonged uses for the water or air supply interrupted efficient fogging.
- Water droplets "wet" some areas unevenly.
- Excess water dripping under nozzle created washout or saturation problems.

Advantages:

- Increased rooting percentages on difficult-to-root taxa.
- Reduction in rooting time. Crop rooting times requiring 20 to 25 days were as much as 5 days shorter.
- Increased vigor. Actively growing softwood cuttings continued to grow during rooting.
- Reduced acclimation period following rooting. Before the introduction of a fogging system, cuttings taken from the mist chamber would often require a substantial amount of time under high shade and frequent low fertilizing. This transition period has been reduced or eliminated.

ADDITIONAL READING

King, P.C. 1993. Fog and air circulation techniques to propagate *Aesculus parviflora* and trifoliolate maples. *Comb. Proc. Intl. Plant Prop. Soc.* 43:470-473.