NAANDAN Irrigation Systems

IRRIGATION-MART we SAVVY irrigation

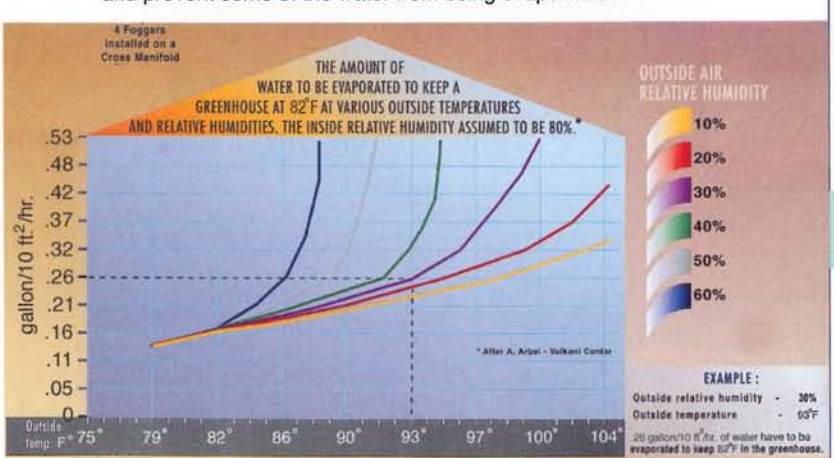
CLIMATE CONTROL OF TEMPERATURE AND HUMIDITY

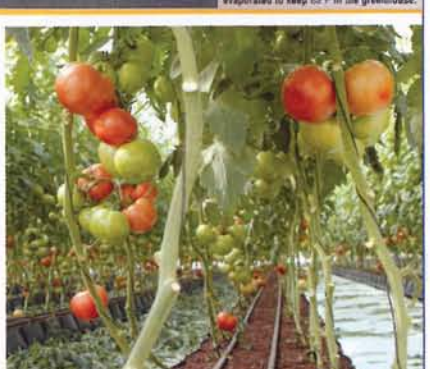
USING NAANDAN FOGGERS

Basic Installation Instructions for Cooling and Humidification

- Use T configuration with 2 foggers (4-way or cross is no longer recommended**)
- Recommended pressure is 60 PSI
- Use High Pressure LPD (Leak Prevention Device)
- Distance between lines up to 9.5 feet
- Distance between foggers on the line up to 4.5 feet
- The foggers should be mounted as high as possible above the ground
- The foggers should be installed perpendicular to the lateral
- Use anti-twist flexible PCV vinyl tube
- Avoid contact between the droplets and any part of the greenhouse structure

**use of 4-way foggers may cause high precipitation rates and prevent some of the water from being evaporated.





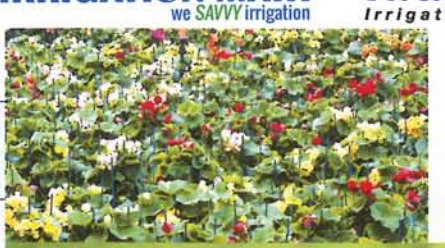
2-WAY T- FOGGER

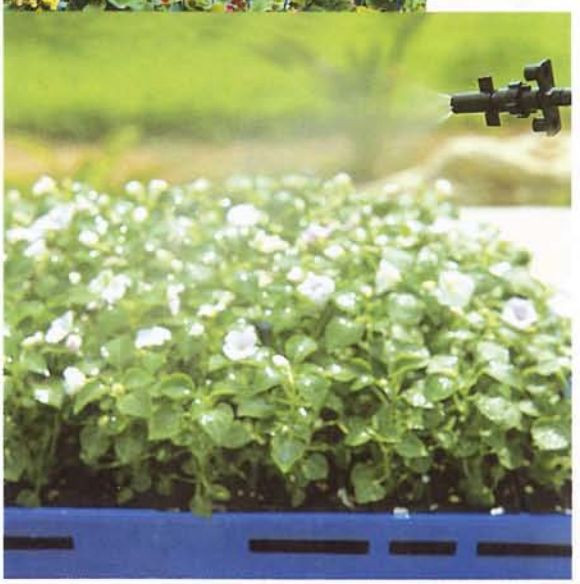
SUPER FOGGER

100 MICRON FOG

- Extremely efficient method for controlling greenhouse conditions
- Fast and easy installation
- Designed to function at standard operating pressures with normal 120 mesh filtration requirements
- Uniform distribution
- Less wear and fewer nozzle replacements
- Highly versatile to fit individual greenhouse requirements

COOLING





- One calorie is the amount of heat necessary to raise the temperature of 1 cm^2 of water by 1° C.
- The conversion of water from liquid to vapor absorbs heat from the surrounding air at a rate of 590 calories per 1 gram of evaporated water. This process lowers the air temperature.
- Efficient installation and operation can reduce the temperature in the greenhouse between 6 to 9° F, depending on two environmental factors: external temperature and external humidity.
- Efficient cooling with foggers requires an effective ventilation system that continually introduces external dry air into the greenhouse to replace the humid air.
- A precipitation rate of .118 inches/hour (3mm/hour) is suitable for cooling.
- The duration of the fogging depends upon the air velocity created by the ventilation system.

Air Velocity	Interval	Duration
0.328 ft/s	10 Seconds	1-2 Seconds
1.64 ft/s	10 Seconds	3-5 Seconds
3.28 ft/s	10 Seconds	10 Seconds

HUMIDIFICATION

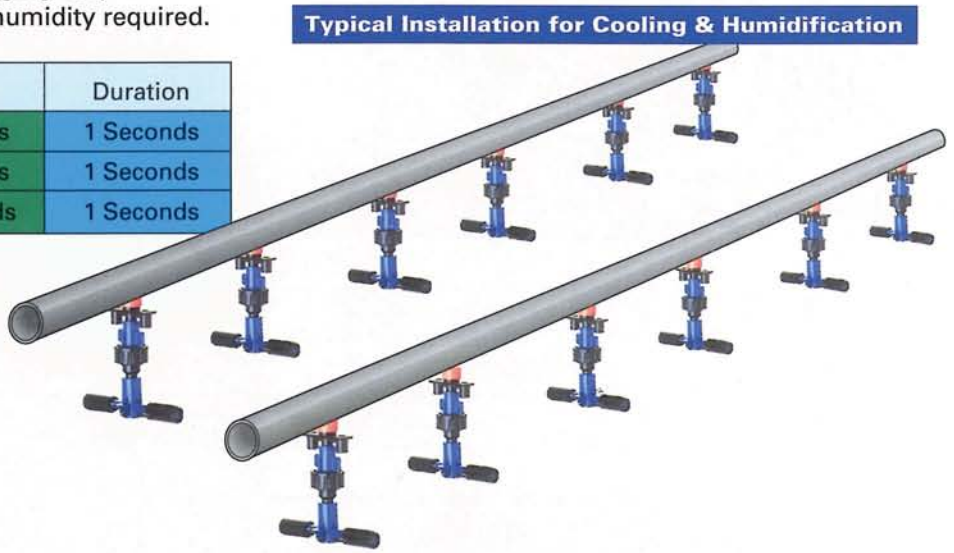
- Ventilation must be shut down in order to increase the humidity.
- The duration of fogging should be as short as possible (1 second).
- The intervals between fogging vary according to the relative humidity required.

Fogger Flow Rates	
Nozzle Color	Flow (GPH)
Blue	1.8
Orange	3.6
Red	5.4
Black	7.4

Humidity	Interval	Duration
30-40%	60 Seconds	1 Seconds
40-50%	90 Seconds	1 Seconds
50-60%	120 Seconds	1 Seconds

A controller should be installed to manage the cycling and should be connected to temperature and humidity sensors.

Typical Installation for Cooling & Humidification



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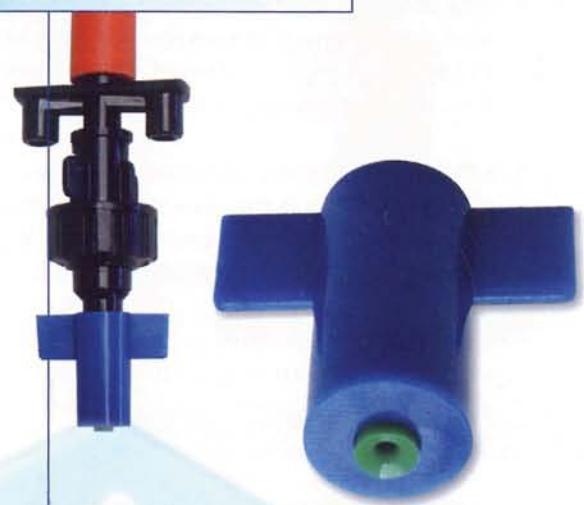
PROPAGATION

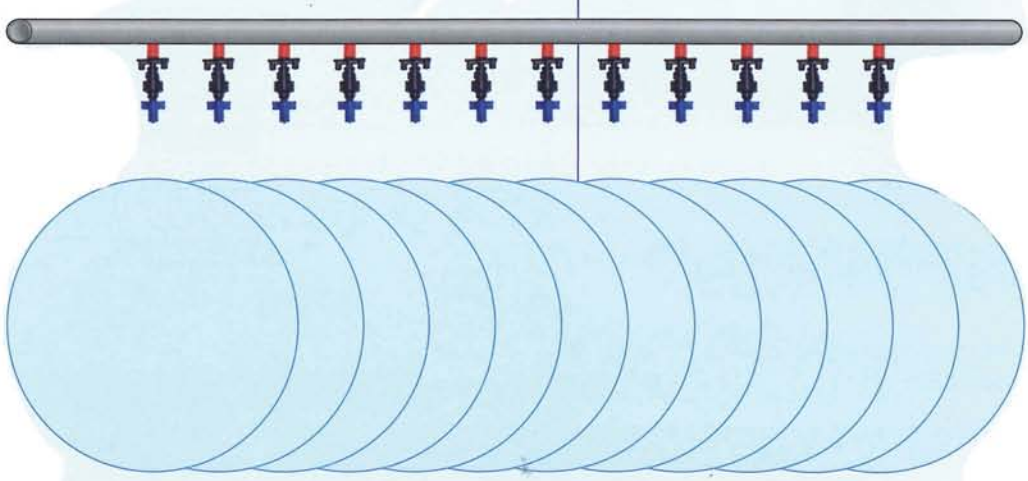
WIDE ANGLE FOGGER

Replaces the 4-way Fogger Assembly and the Violet Mister for Propagation Applications

20% Cost Savings over 4-Way Fogger Assemblies

- Small droplet size- slightly larger than fog, smaller then mist
- Minimum operating pressure 30 PSI
- Flow rate of 7.9 GPH
- Requires low pressure LPD (Leak Prevention Device)
- Height above the bench – 3 to 4 feet
- Maximum distance between units – 2.5 feet
- Maximum distance between laterals – 3.3 feet
- Maximum distance from the edge – 10 inches
- Recommended pressure is 35 to 45 PSI.





MISTING APPLICATIONS

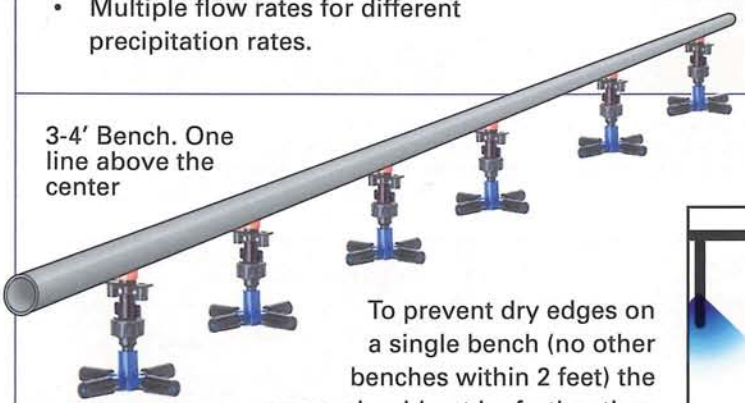
Violet Misting Spreader		
Bench Width	Irrigation Intensity	
	Low	High
3'	Violet Nozzle	Grey Nozzle
4'	-	Grey Nozzle
5'	-	Green Nozzle

IRRIGATION-MART we SAVVY irrigation NAANDAN Irrigation Systems

PROPAGATION

4-WAY FOGGER ASSEMBLIES

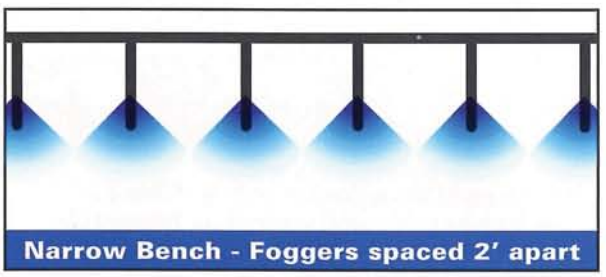
- Recommended Pressure is 35 to 45 PSI.
- One Fogger should be used for every 2.5 square feet. The cross with four foggers will cover an area up to 10 square feet (3 to 4 feet wide).
- Foggers should be installed at a height of 3 to 5 feet above the propagation material.
- The spacing between the fogger assemblies should be 3 feet.
- Multiple flow rates for different precipitation rates.



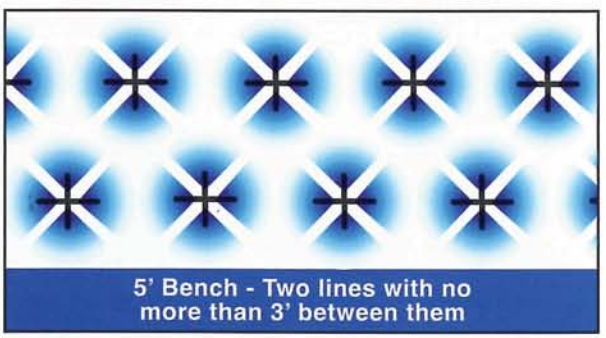
3-4′ Bench. One line above the center

To prevent dry edges on a single bench (no other benches within 2 feet) the cross should not be further than 1′ from the edge. In some instances two lines may be required on a 4′ bench.

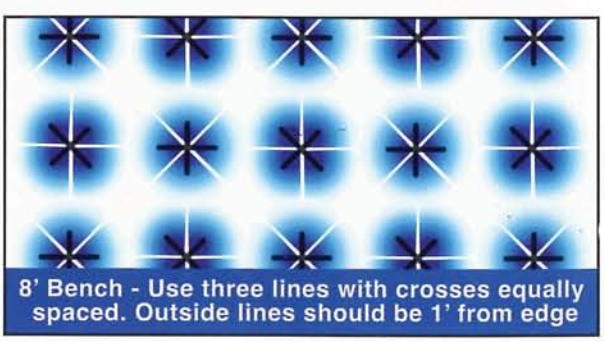
For 6′ and 7′ benches, two lines with crosses are required.



Narrow Bench - Foggers spaced 2′ apart



5′ Bench - Two lines with no more than 3′ between them



8′ Bench - Use three lines with crosses equally spaced. Outside lines should be 1′ from edge