

Mist Nozzle Evaluation[®]

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BACKGROUND

As you would expect numerous papers have been given at I.P.P.S. meetings over the past 50 years on how to use and what to root using mist propagation, but few papers looking directly at types of mist nozzles. In looking at the different mist nozzles the range available is amazing, all claim to do the same thing but in many different ways. They will all provide the cuttings with a covering of water, but how we use them is the critical thing.

As a way to look at the different types of nozzles in use I sent a simple survey to about 300 I.P.P.S. members. The questions I asked were based on current use, as well as past usage and experience. The following questions were asked:

- Advantages and disadvantages of each type of nozzle used.
- Why they had kept or switched from one type to another.
- If a fogging machine or traveling mist boom was in use.
- The type of controller being used.

I received replies from about 100 members a 33% response. The results provide a good indication of the direction that the industry is moving with mist propagation. This is not a scientific study, but a very simple practical look at what works and what does not. If it's in use it must work.

Propagation production areas ranged in size from a couple of hundred square feet to 10 acres, so we covered all types of growers. The total propagation area of the nurseries that responded was 100 acres. As you would expect from an industry as diverse as ours there is no consensus as to the best type of nozzle to use.

Many of the nurseries still using the old style misty mist nozzles indicated they had been using them for years and had the pipes in place and could not see any reason to change — if it isn't broke don't bother to fix it. What they were really saying was I don't want to spend any more money.

Several different types of mist nozzles are now available for propagation use and our members seem to have tried them all.

As one would expect the types of nozzles being used vary from the old timers of bent metal to the latest plastic device. It's hard to say that one is better than the other as all the growers seem to have found a nozzle they like and have stuck with it. It was not until discussions about expansion or construction of new facilities occurs that the newer systems are looked at seriously.

Cost appears to be a major factor when growers are looking at new systems. Many nursery operators said that the old systems worked fine and had been paid for, so there was no reason to replace it with something new, even when the system was not perfect.

New technology has allowed mist nozzles and piping to be produced cheaper than old systems, so it makes sense to look at the newer materials. Plastic now is the material of choice for both nozzles and pipe.

The biggest improvement that has occurred with the new range of plastic nozzles is the addition of an anti-drip device. This device allows for tremendous flexibility

in the layout of a mist system. Traditionally, piping had to be level or water flow would continue from the mist nozzle at the lowest point. The anti-drip device enables upside down use of mist nozzles and the placement of a water line on a slope. The newer devices are pressure sensitive, opening and closing at preset pressures. Another advantage of the newer plastic nozzles is the ability to easily change nozzle parts to provide different mist patterns and water volumes.

MIST NOZZLES CURRENTLY BEING USED

The following are the nozzles currently being used by I.P.P.S. members who responded to the survey. Results are expressed as percentage of those responding.

■ Netafim Dan Mini sprinklers	25
■ Flora Mist /Misto Matic	17
■ DGT Mist Nozzle / Eddy Mist	13
■ Dramm Misty Mist Nozzle	11
■ Naan Mister	7
■ Netafim fogger	6
■ Ein Dor 908	6
■ Spraying systems E-8	3
■ Plastro-Rondo mini / Tornado mister	3
■ Senniger super spray nozzle	3
■ Dramm Watering Stix	1
■ Home made	1
■ Mini Wobbler	1
■ Roberts #635, 436	1
■ Stato-Flo Jet Mister (Agrifin)	1
■ Not Sure, don't remember	1
■ Traveling mist booms	12
■ Fog Systems	7

Netafim Dan Mini Sprinklers. This seems to be the most commonly used mist nozzle, with 25% of respondents using this nozzle.

- This nozzle is easy to install and maintain, it can be used upright or hang upside down from piping supported above the propagation bench.
- It is a relatively cheap system to install.
- This system has a number of different spreader and nozzle combinations depending on the bench width and water pressure.
- To change from misting to watering nozzles is a simple process.
- Good mist created.
- Experience has shown this is not an entirely maintenance-free system. The nozzles can clog easily especially if the water is not filtered properly. When used in the inverted position my experience has been that they tend to drip badly when the mist is on. It is necessary to make sure the nozzles all face the same direction as dry areas can occur created by the C shape design of the nozzle.
- The check valve (anti drip) device works quite well but not as well as the newer spring pressure sensitive devices. Some members complained that the mist did not cover the bench width indicated by the manufacturer.

Flora Mist/Misto Matic. This nozzle was used by 17% of the respondents.

- An original style of mist nozzle having been used for many years and is still very reliable.
- Simple to install and maintain.
- Can be installed on metal and plastic pipe.
- A practical, low-pressure nozzle that provides a flat circular mist spray.
- Very dependable.
- Some had problems with clogging, however they are easy to clean, but it is time consuming.
- They needed realignment from time to time to maintain the correct mist pattern.
- Can only be used in the upright position.

DGT Mist Nozzle/Eddy Mist. Of the respondents 13% used this type of nozzle.

- This is a low-pressure nozzle that is partly self-cleaning as the needle vibrates slightly during operation. They are easy to clean as the pin comes out and it is considered to give a good pattern.
- Low water volume.
- Can be used for irrigation, and any fully water-soluble fertilizer can be applied through the system
- Can only be used upright.
- One problem is that the pin can get bent and distorts the mist pattern.

Dram Misty Mist Nozzle. Of the respondents 11% use this nozzle.

- A plastic nozzle that provides a good quality mist.
- Different sizes available.
- Nearly maintenance free.
- Easy to clean.
- Can only be used in the upright position.

NAAN Mister. Of the respondents 7% use this nozzle.

- A very even spray pattern and inexpensive.
- Similar in design to Netafim, can be used in both upright and inverted positions.
- Has a pressure sensitive check valve which opens when the system reaches the operating pressure.
- Provides a flat spray.

Netafim Fogger. Of the respondents 6% use this fogger nozzle. A mixed response from the users, some preferred this over the regular mist nozzles while other have not had any success and have now removed them and replaced them with netafim misters. It uses the same pipe and assembly as the Dan mini sprinklers. An inexpensive form of fogger which works at much lower pressure than most true-fogging systems.

Ein Dor (809). This nozzle was used by 6% of the respondents.

Another Israeli company that is offering a range of low-volume irrigation misters and irrigation heads. The system is very similar to that of Netafim nozzles and can be used upright or inverted. Pressure-sensitive spring check valve stops any chance

of dripping once system is turned off. This system seems to be gaining popularity. I have heard some very good things about the quality of mist and the reliability of the product. The mist is fog-like and the coverage is excellent the current users say. The mist becomes finer as water pressure is increased.

The following systems are used by a small percentage of those who responded.

Spraying Systems E-8. Large orifice with centrifugal discharge.

Plastro - Rondo mini sprinklers / Tornado Mister. Good distribution, simple to maintain, and inexpensive. Plastro also has two types of mist sprayers available; the Tornado mist sprayer is a nonclogging mist nozzle. It incorporates a vortex mechanism that allows flow of water through larger water passages to prevent clogging.

Rondo Mini Sprinkler. The catalog describes this mini sprinkler as having:

- Exceptional human engineering.
- Good water distribution.
- Simple to install and maintain.
- Inexpensive

Dram Spin Stakes. An older system that has limited use for misting.

Home Made. This was some form of bent wire, similar to a misty mist nozzle.

Mini Wobblers. This is not usually used for mist but some folks are using it.

Slate -Flo Jet Mister SF42. An inexpensive nozzle that gives a very fine mist, not well known.

NEW – NEW – NEW

Netafim MicroNet — VibroMisters. A new style of nozzle from Netafim. This nozzle will probably replace the Dan Mimi Sprinklers. This new design of nozzle eliminates the drip problem associated with the current Dan Mini Sprinklers. The anti-drip device has been redesigned and is constructed with a pressure sensitive spring. The mist is a flat spray and quite fine. The volume of water applied does not appear to be as great as other nozzles so the mist has to be run for longer. These nozzles fit the same piping as used by the Netafim Dan Misters so changing to this new mist nozzle is quite easy.

CONTROLLERS FOR MIST SYSTEMS

- Phytotronic controllers (by this company) were used by 40% of respondents. The newest models have many new features.
- Davis Controller (California) is used by 26% of those who responded.
- Superior Mist Master is used by 10% of those who responded.
- The other systems with very lower usage included: Q-Com, Misto-Matic, Intermatic, A 24-h time clock, Argos, Sterling, Priva, and electronic leaf.

SUMMARY

While this is not a detailed evaluation about each nozzle type, it gives some idea of what the industry is using, where we have come from, and where we are going in the future.