

An Inexpensive Mist System for Plant Propagation

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A reliable greenhouse mist system has been devised at the Forest Service's Northeastern Forest Experiment Station, using inexpensive materials that can be easily obtained.

Because our greenhouses are located on an experimental forest and are not manned every day, we needed a reliable automatic mist system for watering our seedlings and rooted cuttings. The system we designed could be used in other applications.

Construction is simple and can be done with a few tools in the greenhouse or any shop. Supplies are available at most hardware and plumbing stores; and nozzles, timers, and solenoid valves are available from most greenhouse suppl. companies. The following materials are required:

Nozzles:	No. 734 fog mist nozzles.
Tubing:	1/2-inch rigid copper.
Couplings:	1/2-inch sweat-on type.
Plugs:	1/2-inch iron pipe plugs.
Tees:	1/2-inch sweat-on type.
Line strainer:	Cast brass, 100mesh screen.
Solenoid valve:	1/2-inch pipe size.
Timers:	Tork, Model 6100 (long-interval) . Tork, Model 6M8001 (short-interval).
Stop-and-drain valve:	1/2-inch sweat-on type.
Chain:	1/16-inch wire chain.
Miscellaneous:	Short section of flexible garden hose, screw eyes, plumber's strap, pipe clamps, and adapters.

being supported at 4-foot intervals corresponding to the framing of the house. Plastic pipe was not suitable for this purpose.

Our system consists of two lengths of 1/2-inch copper tubing, 44 inches apart, running the length of the greenhouse and suspended from the roof with small-diameter wire chains. Nozzles were spaced 48 inches apart along the tubes, alternating to provide complete coverage. Stop-and-drain valves were placed at 12-foot intervals so that any number of 12-foot sections can be watered at one time. A short length of flexible rubber hose was inserted between the copper tubing system and the water supply to permit raising and lowering the entire system.

The nozzle design determines the mist coverage and, consequently, the spacing of water lines and nozzles on each line. We used standard fog-mist nozzles threaded for standard 1/8-inch pipe and capable of delivering 6 gallons of water per hour at 20 pounds of line pressure.

General Design

Our greenhouses are made of rigid fiberglass panels on standard 4-foot centers, so our mist system had to be a rigid unit capable of

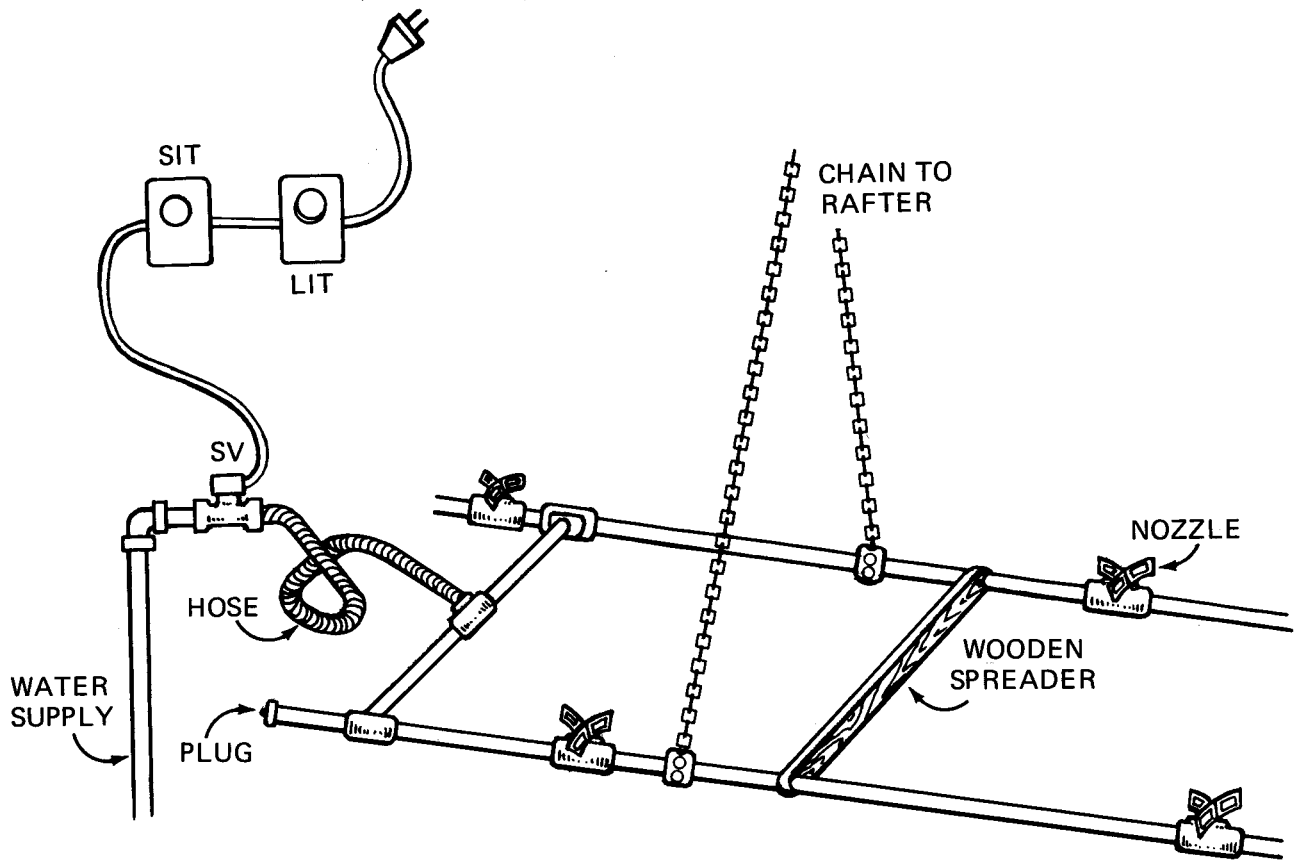


Figure 1.—Mist system: SV=solenoid valve. SIT=short-interval timer. LIT=long-interval timer.

Under these conditions, each nozzle uniformly waters a 4-foot diameter circle.

Construction Details

The copper tubing was cut into the desired number of sections $47 \frac{7}{8}$ inches long. (This length was necessary because $\frac{1}{2}$ -inch sweat-on couplings have a $\frac{1}{8}$ inch shoulder inside, to which the tubing is butted when soldered.) When enough pieces were joined with couplings to achieve the desired length, an adapter was soldered at each end and capped with a standard pipe plug, which can be removed easily to clean or drain the lines.

A $\frac{10}{32}$ -inch hole was drilled into each coupling and tapped with a $\frac{1}{8}$ -inch thread tap. Care was taken to insure that each hole was centered so that the nozzles would be in a straight-up position when installed. The nozzles were then threaded into the couplings. We took the extra precaution of also soldering them in place, because we were not certain that the metal thickness of the coupling would provide a secure union.

The two pipes were joined at one end with a connecting supply tube and at 12-foot intervals with hardwood dividers. A flexible length of heavy-duty $\frac{5}{8}$ -inch garden hose was attached to the intake supply tube. The other end of the flexible hose was connected to a solenoid valve, which in turn was connected to the main water supply entering the greenhouse. The solenoid valve was connected to a short-interval timer, wired to a long-interval timer. Pre-drilled plumber's strap was wrapped around the pipes at intervals corresponding to the rafter positions, with a small bolt through the strap to prevent the tube from turning. The entire system was suspended at the desired height with small chains running from the bolts to screw eyes in the rafters.