



Department of
Horticultural Science

A SIMPLE INTERMITTENT MIST SYSTEM FOR PROPAGATION

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Sophisticated propagation structures are not always required to successfully root ornamental plants (see note below). Summer propagation of many woody ornamentals can be accomplished by rooting softwood or semi-hardwood shoots in inexpensive frames equipped with an intermittent mist system. During high summer temperatures, leafy soft shoots root more readily if structures are equipped with mist.

The structure (**Figure 1**) should be placed in a fairly level location. An east-west orientation may be preferable for more even light distribution. Natural shade is also helpful to reduce heat, light, and consequential high transpirational water losses. Additional shade is desirable and may be provided using 50% polypropylene shade cloth with the ends of the structure left open for ventilation. The shade cloth also reduces wind effect on mist distribution.

The frame can be filled with 5 to 6 inches of propagation medium such as a 25% peat moss:75% perlite mixture or trays and flats filled with medium can be used to direct-stick the cuttings.

An intermittent mist system is composed of plumbing and electrical components (**Figure 2**). Mist lines are usually constructed of Schedule 40 pvc pipe. An in-line filter (strainer) is necessary to reduce any impurities in the water which might clog nozzles. An abundance of mist nozzles are available and must be placed to allow at least 50% overlap for best coverage. Full circle nozzles leave corners of rectangular beds dry unless they fall within the radius of mist coverage. Mist nozzles are available in full circle, $\frac{1}{2}$, and $\frac{1}{4}$ circle coverage and adequate coverage may require using combinations. The electrical system is composed of two time clocks, a 24 hour timer and an interval timer, a 24 volt transformer and a solenoid valve.

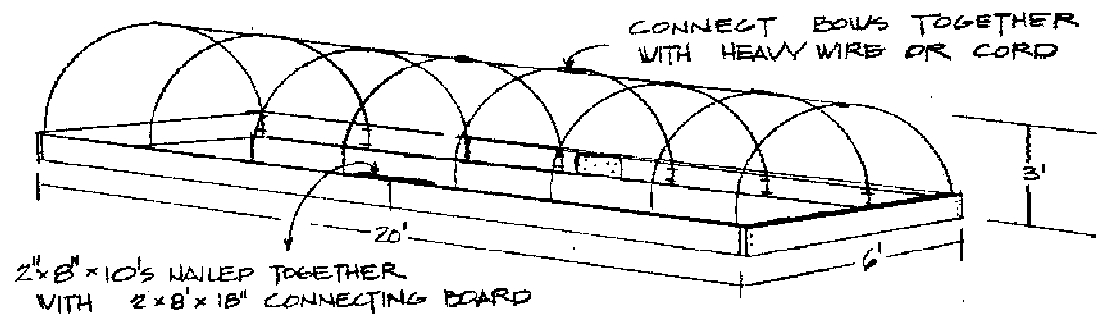


Figure 1

Note: Appropriate structures, construction details, and costs are described in a N.C. Cooperative Extension Service Horticulture Information Note, Leaflet No. 404, entitled "*Low Investment Propagation/Winter Protection Structures.*"

The 24 hour clock turns the interval timer on at a specified time in the morning and shuts the interval timer off at a specified time in the evening, usually 2 hours after sunrise and 1 hour before sunset. Interval timers turn the mist on for specified lengths of time during daylight hours.

A variety of interval timers are available, differences consist of how many minutes are required to complete one clock cycle. A 10 minute timer completes 1 cycle in 10 minutes and the least frequent mist interval would be 10 minutes. Likewise a 6 minute interval timer completes a cycle in 6 minutes and misting occurs at least once every 6 minutes. The time clocks which require 110 electrical voltage are usually placed in sheltered areas away from weather and the mist system. A 110/24 volt transformer should be installed to reduce the electrical voltage leaving the interval timer to 24 volts. The solenoid valve is an integral part of the plumbing and electrical system and since moisture is always present, 24 volts is much safer, therefore a 24 volt solenoid valve is also required. Solenoids are electrical valves which allow water to pressurize the mist system and spray during the mist cycle. A large selection of solenoids are also available. Metal/brass and plastic/PVC housings are usually the major choices. Metal/brass solenoids are usually more expensive, however they also have quicker impulse/response than plastic solenoids. This can be an advantage in frequently misted propagation units, since considerably less water will be misted over long propagation periods.

Fall and winter propagation in a frame is also possible. A white copolymer plastic covering is used to enclose the frame and is preferable to clear plastic, especially if any direct sun strikes the frame. Fall and winter propagation does not require a mist system, since high humidity can be maintained in the covered frame. A frame equipped with mist should be drained and winterized. Fall and winter propagation is more successful if the frame is equipped with heating cables to provide bottom heat, placed under the rooting medium or flats. Rooting medium temperatures during fall and winter should remain around 70°F. A piece of ½- or ¼-inch hardware cloth placed over the heating cables help distribute the heat more evenly throughout the medium or to the bottom of flats placed on the hardware cloth.

A list of materials and approximate costs for the mist system are given below. See *Hort. Info. Leaflet No. 404* for construction details of the propagation frame.

Mist System

Design - 1 solenoid with 2 mist lines 30 inches apart running the length of the frame. Mist nozzles placed 30 inches on center down each line. Approximately 30 psi is required to provide adequate mist coverage.

Quantity	Description	Approximate Cost*
34 ft	Schedule 40 pvc	@ \$0.27/ft = \$9.18
9	tee's	@ 0.39 = 3.51
8	caps	@ 0.24 = 1.92
8	elbows	@ 0.90 = 7.20
2	bushing + plug	@ 0.89 = 1.78
16	mist 100 nozzles	@ 1.05 = 16.80
1	filter	6.99
1	gate valve (PVC)	8.49
2 sets	bushings/couplers	@ 0.40/set = 0.80
1	24 volt solenoid (normally closed)	47.69
1	24 hr. clock	26.66
1	10 min interval timer	51.47
1	24 volt transformer	6.83
		Total \$189.32

*Local retail prices, actual costs may vary.

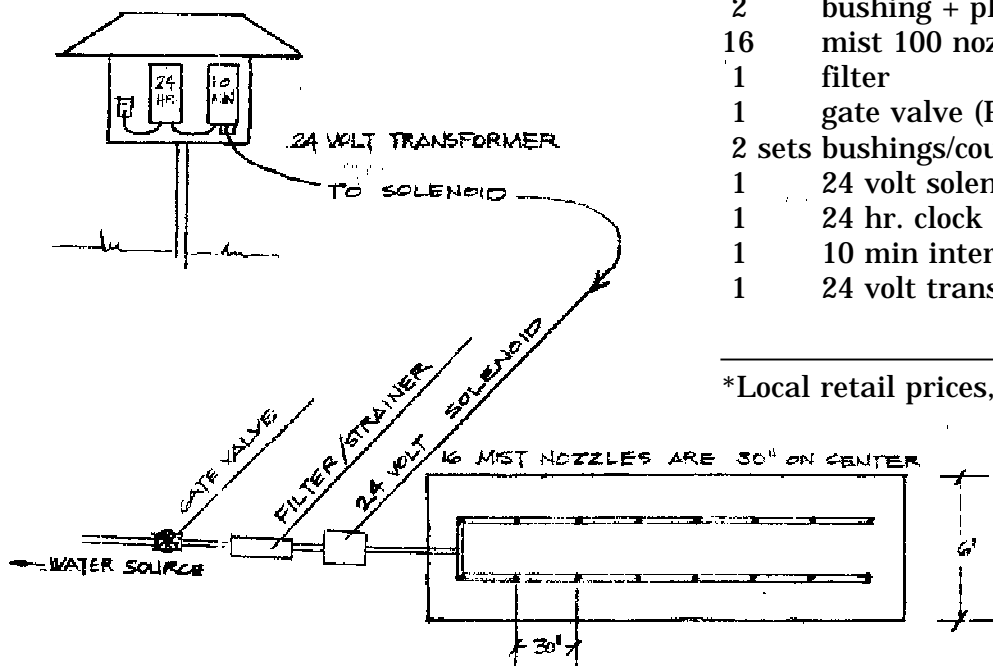


Figure 2 - Mist system layout plan view