

SUNDAY MORNING SESSION

October 16, 1960

Mr. Robert Tichnor, Oregon State College, North Willamette Branch Experiment Station, Aurora, Oregon, moderated the Symposium. Chairman Tichnor introduced Mr. Martin Usrey, Monrovia Nursery Company, Azusa, California, who presented his paper on techniques of propagating under mist at the Monrovia Nursery Company.

MIST SYSTEMS AND HARDENING-OFF PROCEDURES AT MONROVIA NURSERY COMPANY

MARTIN USREY

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Description of the Intermittent Mist System

The intermittent mist system is composed of a series of mist nozzles controlled by a system of solenoid switches, clocks, and intermittent timers. The nozzles used are the Spraying Systems $\frac{1}{4}$ TTN4W nozzle or the Flora-life wire baffle nozzle. The interval of misting varies between 12 and 18 seconds "on," every 6 minutes during hot weather and every 12 minutes during cooler weather. The TORK timer is used, because of its versatility in setting intervals. The timer makes a complete cycle each 6 minutes, however, by connecting all the interval timers to one master timer any multiple of 6 minutes is possible. In this way, the timers can be set to give the minimum amount of water for the corresponding weather conditions. Electric clocks are set to turn the system on in the morning and shut it off in the evening. The moisture present is usually sufficient to carry over the cuttings through the night.

Description of the Fog Mist System

The fog mist is an electronically controlled high-humidity system. The relative humidity, at 85% or higher, is electronically controlled with an American Instruments Company humistat. Moisture is supplied to the atmosphere through Spraying Systems pneumatic atomizing nozzles through a pressure system. The pressure system is different from the siphon system in that water fed to the nozzles is under pressure. Piping in both mist systems, intermittent and fog, is now being placed overhead for ease of maintenance, and as a protective measure to keep water away from the solenoid switches.

Hardening-off Softwood Cuttings from the Intermittent Mist

Softwood cuttings are normally kept for 4 weeks in the intermittent mist. After rooting, the cuttings are moved into another glasshouse with plenty of air circulation. Misting is continued, but at a much reduced rate. During the first few days, cuttings are mist-watered every hour. Gradually, the mist is reduced to two times per day.

The length of time for hardening-off depends on the type of cutting, softwood or hardwood, and also on the species. To give you an idea of the length of time for hardening-off, I will explain the experience we have had with a particular item, *Xylosma senticosa*. Originally, *Xylosma senticosa* was hardened-off for a 10-day period in a well-circulated glasshouse. It was then taken out under single lath for 2 weeks before potting. After potting, it was placed under double lath. The results were very poor.

For *Xylosmas*, we now lengthen the hardening-off period in the glasshouse to 2 weeks, followed by hardening-off for 2 months under double lath outside.

During the hardening-off period, cuttings are fertilized once a week with a weak liquid fertilizer. This fertilizer has all of the major elements plus magnesium, sulfur, and iron. Under this system of hardening-off, the cuttings developed a better root system, and results were 75% better.

Hardening-off Harder Wood Cuttings from the Intermittent Mist

The harder wood cuttings are generally placed directly under double lath outside, and mist is sprayed at a frequency similar to that with the softer cuttings. The cuttings are fertilized once a week with a liquid fertilizer. For example, *Mahonia 'compacta'*, which comes under this heading, was originally kept in a glasshouse 8 to 10 days for hardening-off and then placed outside for 2 weeks under single lath. Survival under this system was very poor. We get much better results now by placing Mahonias in a glasshouse with open ventilation — day and night for 2 weeks (essentially outdoor conditions) — and then under single lath for 2 to 3 months. Potting at the beginning of the growing season was the best time for this operation. Cuttings are sprayed and fertilized, as are the softer cuttings.

The two cuttings described above as examples are particularly difficult items for hardening-off. Generally, the period for hardening-off outside is shorter for less difficult subjects.

Hardening-off Conifer Cuttings from the Fog Mist

Conifer cuttings taken from the fog mist are placed directly outdoors under double lath and handled as are the harder cuttings above.

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Chairman Tichnor introduced Mr. William J. Curtis, Wil-Chris Acres, Sherwood, Oregon.

MIST PROPAGATION WITH EMPHASIS ON HARDENING-OFF

WILLIAM J. CURTIS

Wil-Chris Acres, Sherwood Oregon

Mr. Chairman and Fellow Propagators:

I have been asked to talk to you gentlemen on "Mist Propagation, with Emphasis on Hardening-Off." We in the Northwest who propa-