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MISTING FOR SUMMER PROPAGATION

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The use of mist nozzles in the greenhouse has received considerable attention from research institutions and growers alike, and because of the possibilities for better crops and savings in labor the interest is increasing. There are still many unanswered questions about the use of mist. The progress that has been made in this field in recent years has been made possible by the development of more suitable equipment and yet there is still considerable room for improvement in this respect. Particularly in the rooting of cuttings, where the failure of equipment may mean loss of the plants, it is necessary to have equipment which is as rugged and foolproof as possible. Due to the high degree of success in mist propagation here at the University this past summer it seems desirable to report on this season's work.

Equipment

Misting equipment was set up in June 1955 both outside in a coldframe and in the greenhouse. No shading material of any sort was used on the greenhouse or over the cuttings and ventilators were kept open. Oil burner types of nozzles giving a conical spray were placed on each side of the cold frame at the top of the side wall (about 2 feet high) and along each side of a greenhouse bench about 4 feet above the level of the upper edge of the bench. The nozzles pointed towards the center of the bench and slightly upwards. Both of these mists operated continuously from daylight until dark for the first experiment but were controlled by an interval timer in the second experiment so that they operated about 20 seconds out of each minute. These nozzles were rated to deliver 6 quarts per hour at 50 pounds pressure. (The water pressure for this installation was less than 75 pounds) One of these nozzles was found to adequately cover 2 linear feet of a bench 4 feet wide.

Over another bench in the greenhouse was placed a single line of impinging type nozzles producing a flat circular spray. These nozzles had a designated output of 6 gallons per hour per nozzle at 20 pounds pressure. One on this type nozzle adequately covered 4 linear feet of a 4 feet wide bench, when placed 2 feet above the propagating medium. These nozzles were operated by an "electonic leaf" but for periods of time when the leaf was inoperative an interval timer was used to operate the nozzles 5-10 seconds per minute of the daylight hours. "Leaf" operation approached this when adjusted to keep softwood cuttings from wilting on hot summer days.

The sand used as a rooting medium was a sharp but fairly fine grade of bank sand. For purposes of comparison, cuttings were also stuck in a heavily shaded propagation house in which good results had been obtained in the past. Some of the results are given in the following table (Table 1).

Better Rooting

Although the impingeing type of nozzle controlled by the electronic leaf did not give the best results as shown in the table it produced satisfactory results and did give better results by the end of the summer when there was some clogging of the other type of nozzle. In all cases better rooting was obtained by rooting under mist than in the propagation house when tested under hot weather conditions. Excessive stretching of cuttings under mist was not experienced although cuttings did continue to grow while in the process of rooting since under this system they never wilt.

Any growth in the early stages of rooting depletes the stored materials within the cutting and when roots do form there was no fertilizer available to them in the sand. Mist propagated cuttings of poinsettias were lighter green in color although they were huskier and had more roots. When potted up and placed in full sun along with the cuttings from the propagating house the misted cutting showed considerable yellowing and leafburn although none of the plants died. They did resume growth sooner and responded quickly to fertilizer treatments.

better was the appearance after potting. The fertilized cuttings showed less leaf burn, better color and started growth sooner.

Rooting in Pots

At the same time as this last group of cutting was taken, groups of unrooted poinsettia cuttings were potted in 2½ inch pots using a soil mixture of one half sandy loam and one half peat moss and also put under the different mist treatments. These were fertilized twice a week after callus growth started. These cuttings rooted just as quickly as the ones in sand as roots were visible at the side of pot at the time the other cuttings were taken from the sand and potted. At this same time the cuttings rooted in pots were simply put in the growing bench where they continued without noticeable check in growth.

In this last case it was possible to produce a cutting established in a 2½ inch pot in the same time and with the same labor as that required for producing a rooted cutting in sand. Since no check in growth was experienced the cuttings rooted in pots were superior to those rooted in sand even with fertilization and the problem of light colored foliage and leaf burning appeared to be solved.

The third propagation of poinsettias on September 20 was done entirely in 2½ inch pots under mist with excellent results. The young plants were panned by October 15 with no check in growth.

Table 1. Rooting of various types of cuttings in the summer. Score 5 Perfect rooting.

Kind of Cutting	Date Taken	No. days to root	Propagation house check	Constant mist in cold frame	Constant mist in greenhouse	Electronic leaf mist in greenhouse
Better Times Roses	June 28	21	4.17	4.47	4.90	4.45
William Sims Carnation	June 24	28	2.17	4.37	4.36	3.82
Coral Bells of Azalea	June 30	40	2.50	3.74	3.42	2.80
Strafford Hydrangea	June 27	30	2.38	3.97	2.78	3.00
Barbara Ecke Supreme Poinsettia	July 18	20	2.98	4.48	4.55	3.75
Ruth Ecke Poinsettia	July 18	15	3.10	4.20	4.64	3.26

Table 2. Rooting of poinsettia cuttings under mist with the addition of liquid fertilizer to the rooting medium. Cuttings stuck on August 18. Average rooting score for Ruth Ecke and Barbara Ecke Supreme.
Score 5 Perfect rooting

	No fertilization	Fertilized twice a week	Fertilized every day	Average
Mist controlled by time clock in cold frame	3.60	3.66	3.84	3.70
Mist controlled by time clock in greenhouse	3.98	4.42	4.52	4.31
Mist controlled by electronic leaf in greenhouse	3.64	4.11	4.15	3.97
Average	3.74	4.05	4.14	

Poinsettias

In the second experiment using only poinsettias an attempt was made to correct for possible fertilizer deficiency by watering with a liquid fertilizer (25-10-10) 3 pounds per 100 gallons) after the cutting had started to callus. Again, the cutting under mist rooted better than those in the propagation house but the use of fertilizer twice a week or every day did give an additional favorable response as shown in Table 2. More striking than the tendency to root

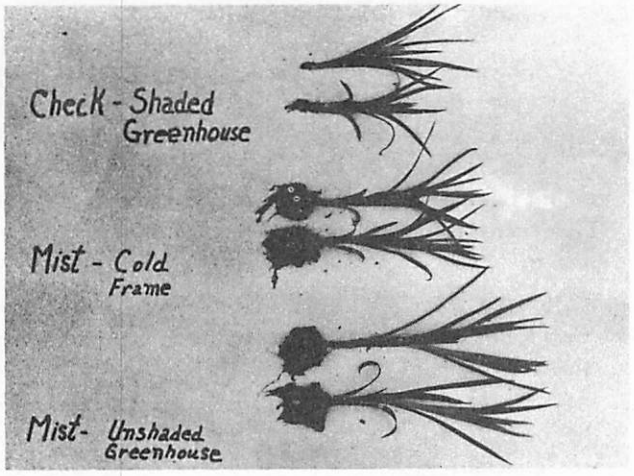

Figure 1. - Comparison of carnation cuttings rooted under mist and in the propagation house.

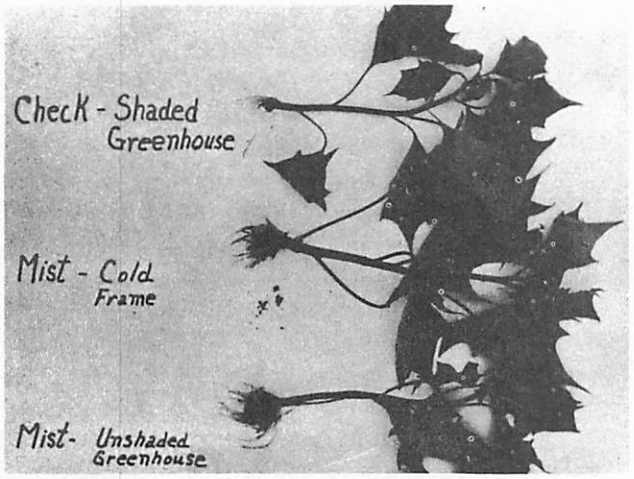

Figure 2. - Comparison of poinsettia cuttings rooted under mist and in the propagation house.

Conclusions

In summary, it is felt that the use of mist in a superior means of rooting cuttings during the hot weather. There is an indication that some kinds of cuttings as hydrangeas and azaleas may do better outside rather than in the greenhouse during periods of excessive heat. The rooting medium may be any commonly used material but should be well drained and not be packed under any circumstances. The mist should be fairly fine, uniform in coverage, and supplied in slight excess so that cuttings never wilt and hand syringeing and watering is completely climinated. Misting should be done in full sun. Fertilization of the cuttings during the later stages of rooting may be desirable to avoid checks in growth due to nutrient deficiencies.

We have had sufficient success with rooting poinsettias in pots in a soilpeat mixture to recommend this procedure for use on a large scale, and suggest that mist lines simply be set up in the growing houses. Other types of cuttings, particularly carnations, will be tried by this method starting next spring.

Propagation by mist in the cold weather does not offer the advantages that come in the hot weather as the ordinary propagation house is more suitable during the cooler part of the year. The use of these same types of nozzles for humidification of propagation houses should not be overlooked as they can be automatically controlled by humidostats. The principle difference in the use of mist for propagation in open houses in the winter will probably be in avoiding the use of more than the minimum amount of water so that the cuttings will not be chilled. The use of warm water might be desirable.

Poinsettia Propagation

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SIZE OF CUTTINGS

The size of the cutting varies slightly with the time they are taken. Cuttings propagated early in the summer are shorter than those taken in mid-September. Generally a medium size cutting about 4 inches in length is best. Thin cuttings should be avoided. Weak stems on stock plants should be pinched without taking a cutting. Cuttings that are very heavy take up too much room in the propagating bench. The stock plants should be permitted to grow so that after a cutting is removed there will be at least two leaves left on the shoot to produce another crop of cuttings.

TIME OF PROPAGATION

The time of propagation for the first important crop of cuttings is usually early August. Cuttings taken at that time will produce nice single stem plants for 10, 11 and 12-inch pans. Cuttings taken in July will usually grow too tall for single stem plants, but these cuttings are useful as a means of building up stock for the more important September propagations.

The July cuttings can be handled in two ways. Dr. James Shanks of the University of Maryland recommends benching them in the greenhouse at a 10 x 10-inch spacing and making a soft pinch after the new growth has reached a length of 8 to 10 inches. This pinch must be made before August 15. The plants are allowed to develop and cuttings are taken from them in September.

The other method is to plant the July cuttings in pots and when they have developed remove a cutting from the top in place of a soft pinch. These cuttings can then be rooted and grown on. The potted plants remaining will make good pinched plants with moderate size bracts.

The crop of cuttings taken in late September are the most valuable as they will produce excellent single stem plants for 5, 6 and 7-inch pans.

STICKING CUTTINGS

When taking cuttings the position of the cut can be either at the node or between the node. It is usually easier to make the cut between the leaves and when done in this manner no trimming of the cutting is necessary.

In collecting cuttings, the most strict sanitation measures should be followed at all times. Never place the cuttings on a "dirty" bench or in a "dirty" flat. Use sterilized flats or boxes to carry the cuttings from the stock plant house to the propagating bench. Should it become necessary to lay the cuttings down, a sheet of clean newspaper placed under them will help to prevent contamination of the plants. In no instance should the cuttings be placed on the same bench where the stock plants are growing.

If you use a root promoting substance, apply it with a duster. Do not dip the ends of the cuttings into the powder as this procedure will spread disease if there is any present.

Perlite, vermiculite, sand and sand and peat have all been used successfully for rooting poinsettia cuttings. Good drainage in the bench and the medium is very important. Steam sterilization of the propagating medium before use and between each crop of cuttings is absolutely necessary for disease control.

Do not crowd the cuttings in the bench. Cuttings that are spaced 3 inches apart in the row with 5 to 6 inches between rows will not be too close. Crowding the cuttings will cause leaf drop due to botrytis and shading.

A heavy watering when the cuttings are stuck will firm the soil around them with no need for tamping. Some shade may be applied to prevent excessive wilting of the cuttings. This shade should be removed as soon as possible. Several heavy waterings daily plus frequent syringing when the cuttings are first stuck may reduce the need for shade.

The use of automatic misting equipment has enabled growers to root poinsettias in full sunlight with no loss of plants. Refer to PFG Bulletin 74 for details of a misting system. Here at Penn State cuttings have been rooted directly in 2¼-inch pots under mist using a half-sand, half-loam soil mixture.

Shanks at the University of Maryland recommends feeding misted cuttings every 2 or 3 days after they have callused. A 25-10-10 soluble fertilizer at 3 pounds per 100 gallons has given good results.

Cuttings can also be rooted in the pans in which they will flower, but too much propagating space is required. This method also prevents the grower from selecting plants of uniform growth for panning together.

DON'T FORGET!!!!

M.F.G.A. FALL MEETING

UNIVERSITY OF MASSACHUSETTS

AMHERST

OCTOBER 15, 1957

SAVE THE DATE

STANLEY HIXON RESIGNES

It is with deep regret that Pres. John Duffy must announce the resignation of Vice-President and program Chairman Stanley Hixon from his duties. Due to untimely death in his family and increased duties in his business, Mr. Hixon feels that he must devote his time to other things and must relinquish his office.

In the interim, Reginald Carey of South Hadley Falls has agreed to serve as program chairman for the fall meeting on October 15th. At the business session of the fall meeting, a special election will be held to fill the vacancy created by Mr. Hixon's resignation.

LET'S MAKE CUSTOMERS NOT JUST SALES!

Reprinted from
Bulletin of the Credit Bureau of Greater Salem, Inc.
Bulletin No. 658, November 16, 1956

It ought to be as plain as the nose on your face: A sale is often a spotty thing, like dappled sun in a forest. It is sometimes a one-shot affair, never repeated for one reason or another.

But a customer is a many-splendored thing!

Customers repeat like the hiccups. If they like the product and the service, they come back again and again, like animals to a water-hole. The repeating is what makes them customers. . .a habit to be cultivated and nurtured and tended with patient care.

Sometimes. . .let's face it. . . .profit may lie in losing a single sale and winning the prospect's respect. Such a procedure, when indicated, is plainly an investment in good-will. The principle applies whether we sell on the hoof or behind a typewriter. As Mr. Lincoln put it, you can fool some of the people some of the time, but a sale on the basis of damn the torpedoes, full speed ahead, puts no customer on the books.

Advertising that plays fast and loose with the facts will fall of its own weight by the simple process of spreading bad news. Sales made by even the slightest misrepresentation will backfire. You never forgot that ebullient dentist who said: "This won't hurt a bit." Let's make customers. . .not just sales!

Our Association is growing larger and stronger all the time. If you know of any florist who is not a member, invite him to join M. F. G. A. NOW!