Direct Rooting of Poinsettias in 2 1/4'' Pots by Russel Weiss

This past season after successively rooting 125,000 poinsettias directly in 2 1/4'' and 3'' pots, we can say that we will never use sand again. With mist and under sterile conditions we were able to propagate poinsettia 100% in sand, but we have switched to direct rooting because less labor is involved, rooting percentages are also 100%, and quality is improved. Once the proper system is arrived at, sterile established 2 1/4'' pots may be produced in less time than where sand was used as the rooting medium.

These things are a must, however, if direct rooting is to be done; a steam sterilized, well drained soil mixture preferably one in which 20% perlite is incorporated, a good misting system and a source of well fed cuttings. We have rooted plants in 2 1/4'' and 3'' clay pots and peat pots, but we prefer clay over peat because of the drain hole in clay which allows for rapid drainage.

Basically all that is involved is replacing the sand bed with 2 1/4'' pots filled level with soil. These are placed in flats on the propagating bench and the bench, flats, soil, and pots are steam sterilized all at one time. The pots are then lined out on the bench tight in the rows with 3 inches between rows. The freshly taken cuttings have been stuck, one to a pot, and the mist turned on. The misting cycle at the start should be 12 seconds every 3 minutes.

Some shade on the glass is needed in the first three or four days after which only a light shade is needed. (The less shade, the better.) The misting is decreased until 12 seconds of mist is used every 15 minutes. This should happen around the tenth to the twelfth day. After this, the plants may be removed from the propagating house to a lightly shaded house where a few hand syringings will keep them turgid. We like to move them from the mist as early as possible since the plants stay shorter and the leaves are not leached by the mist. In about 15 to 18 days a nice well-rooted 2 1/4'' or 3 inch poinsettia may be obtained which can then take full sunlight.

One thing we find is that plants which are mist propagated must be maintained at a high fertilizer level. Espe-

(continued on page 2)

*Editor’s Note—Russel Weiss, a Cornell graduate, along with his father, Mr. Kurt Weiss, operates a 175,000 square foot pot plant range in East Meadow, Long Island. They specialize in azaleas, poinsettias, lilies, hydrangeas, and geraniums. Last year they tried direct rooting of poinsettia cuttings under mist in an attempt to reduce labor and eliminate chances for disease contamination. Mr. Weiss is convinced that a rigid sterilization and sanitation program is a must if consistently good poinsettias are to be produced year after year. Here are some of his thoughts on the direct rooting of poinsettia cuttings under mist.

Poinsettia Culture and Root Rot Control

R. A. Larson and D. F. Bateman
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The relation of environmental factors to development of the poinsettia root rots was recently discussed by Bateman (1). On the basis of his work he concluded that controlled environment (temperature, soil pH, and soil moisture) could be a supplement to the "complete sterilization program" now recommended (2). It was stipulated, however, that before this could become a grower recommendation further work would have to be done under conditions which would more closely approximate those the grower is likely to obtain in terms of controlled environment. Such an experiment was conducted in 1960, in which the findings of poinsettia root rot studies at Cornell were evaluated with respect to their adaptability and/or feasibility in a recommended cultural program.

It should be noted that Shanks and Link, at Maryland, made an extensive study of cultural factors and the incidence of certain soil-borne diseases of poinsettia (6). The influences of soil pH, temperature, and fungicides were considered. Much of the groundwork for their studies had been obtained from the work of Keller and Shanks (3).

Studies at Cornell conducted under controlled environment indicated that root rots of poinsettia were minimized when a soil temperature of 65°F was maintained, along with low pH (below pH 5.5) and low soil moisture (about 45% moisture holding capacity). Low soil temperature was considered to be the primary factor giving control of Rhizoctonia and low moisture resulted in the control of Pythium. A low soil pH reduced damage caused by Thielaviopsis and Pythium.

An air temperature of 65°F has been strongly recommended by Larson and Langhans (4), so the temperature considered desirable for root rot control by the pathologists when used in combination with low moisture and low soil pH corresponds with the temperature recommended by the floriculturists as being desirable for plant growth, rapid flowering, and good bract development. Growers have given little attention to soil pH with regard to poinsettia culture, while the pathologists have noted a marked decrease in root rot incidence at a low pH (below 5.5). A slight controversy does arise between the pathologists and the floriculturists with respect to soil moisture levels. Low moisture levels have been advocated by the pathologists because damage due to Pythium would be decreased. The floriculturists have hesitated to recommend low moisture (continued on page 3)
Poinsettia Culture and Root Rot
(continued from page 1)

levels because of the possibilities of leaf drop and bract abscission (5).

The purpose of the cooperative investigation reported herein was to determine if the previously mentioned environmental conditions would result in minimum disease development under simulated commercial conditions and still result in high-quality, salable plants.

Methods

Cuttings of the variety Barbara Ecke Supreme were taken on August 30, 1960 and placed in 3" pots under intermittent mist. The rooted cuttings were placed in 5" pots on September 30. Supplementary lights were given from 10-2 at night from September 20 to October 10. Nine hour days were then started on October 10.

When the rooted cuttings were placed in the 5" pots they were put in the following soil treatments: sterile soil, non-sterile soil, and non-sterile infested (Thielaviopsis, Rhizoctonia and Pythium) soil. Two soil pH levels (5.0 and 7.0) were used. The plants were divided into 2 groups, and half were watered every day and the other half were watered every 3 days. All treatments were studied at 50° and 70°F.

Results

None of the plants grown at 50°F flowered for Christmas regardless of treatment. The mortality rate was extremely high for plants grown at 50° in non-sterile and infested soils regardless of soil pH. Recontamination of the sterile soil treatment was only slight, but a little root rot developed in this treatment at the low temperature. Plants moved from 70° to 50° on December 1 were severely damaged by the root rot pathogens.

The time of flowering was not appreciably affected by the various environmental treatments at 70°. All the plants were in flower by December 16, except plants grown in infested soil at a pH of 7 flowered about 6 days later than plants in other treatments.

A comparison of frequency of watering and soil treatment on increase in plant height, increase in number of leaves, bract diameters, date of flower, root rot reading, and root weight can be seen in Figures 1 and 2 (on pages 4 & 5). All plants shown in Figure 1 were grown at pH 5. Plants grown in a soil of pH 7 are shown in Figure 2.

Average bract diameter was the same in sterile, non-sterile, and infested soil at a pH of 5. Bract diameters of plants grown at pH 7 in the sterile soil treatment were the same as those obtained at a pH of 5. Considerable reduction of bract diameter occurred, however, when plants were grown at pH 7 in non-sterile or infested soil.

Plant height was greatest in sterile soil watered daily, and the pH seemed to have little effect. The plants grown in sterile soil but only watered every 3 days were 6 to 7 inches shorter.

At the conclusion of the experiment the root systems of all plants were inspected for root rot, and fresh root weights were recorded. Root rot at 70° caused heavy damage only at pH 7 in the infested soil. Greater control was achieved with the acid versus the neutral soil. All root rot data indicated that low soil moisture was not as influential in controlling root rot at 70° as it was at 50°. Soil moisture did have considerable influence on root weight at 70°. Root systems in soils watered every 3 days weighed only about half as much as those which were grown in soil where water was applied daily, at pH 5.0. The differences were negligible at pH 7.

Conclusions

According to the results of this study a grower could expect the greatest disease control at 70° in sterile, acid soils where water was applied every 3 days. The heights of plants grown under such conditions were more satisfactory than those obtained when the plants were watered daily. However, there may be a distinct possibility for leaf drop or bract abscission at low moisture levels.

It should be stressed that the authors do not suggest a cultural program of acid, dry soils as a substitute for the recommendations of "complete sterilization program," although these tests indicated that one can grow salable poinsettia plants in spite of root rot pathogens by proper environmental control. Not all growers are able to effectively sterilize their soil, benches, pots and other equipment at the present time, and they could reduce their root rot problems by maintaining a pH of 5, using a well-drained soil, and keeping the plants at 65-70°. For the grower who is able to effectively sterilize his soil and equipment, this cultural program could be an added form of insurance. Recontamination does occur in the greenhouse, and an acid, well-drained soil, and maintenance of the above indicated temperature range will reduce losses to a substantial extent.

Literature Cited


1961 State Fair

"Flowers for you," is the 1961 theme for the New York State Fair N.Y.S.F.G. florists exhibit to be staged at the horticulture building in Syracuse, New York beginning September 1st and ending September 9th.

Phillip Allen, of Stimmings Greenhouse, at Ithaca, New York, N.Y.S.F.G. State Fair Chairman, says this year's show will feature a series of 10 displays of modern arrangements illustrating the use of flowers in daily living at home, at business and social affairs. Emphasis will be on the use of New York State flowers, unusual containers and accessories.

A cash award of $500 will be awarded to the most outstanding designer. A second place cash award of $300 and a third place award of $200 to designers. Designers not placing 1st, 2nd and 3rd will be awarded $150 for participation provided they install and maintain a neat and attractive display throughout the 9 days to the satisfaction of the State Fair Committee.

Additional cash prizes and awards will also be made for meritorious work.
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Results
None of the plants grown at 50°F flowered for Christmas regardless of treatment. The mortality rate was extremely high for plants grown at 50°C in non-sterile and infested soils regardless of soil pH. Recontamination of the sterile soil treatment was only slight, but a little root rot developed in this treatment at the low temperature. Plants moved from 70°C to 50°C on December 1 were severely damaged by the root rot pathogens.

The time of flowering was not appreciably affected by the various environmental treatments at 70°C. All the plants were in flower by December 16, except plants grown in infested soil at a pH of 7 flowered about 6 days later than plants in other treatments.

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3
### Watered daily

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### Watered every 3 days

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<td>Root weight (grams)</td>
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**Figure 1.** Influence of soil moisture levels and soil treatment on increase in plant height, increase in number of leaves, date of flowering, rot reading, and root weight. The cuttings, of the variety Barbara Ecke Supreme, were propagated August 30, and 9 hour daylengths were started October 10. All plants were grown at a pH of 5.

\(^1\) Heights and numbers of leaves were recorded on October 1, 1960, and the final data were taken on January 9, 1961.

\(^2\) Date of flowering was determined to be the date when half of the plants in a treatment had the first stamens showing.

\(^3\) 0 = no root rot, 5 = all roots rotted.
### Watered daily

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### Watered every 3 days

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<td>11</td>
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**Figure 2.** The influence of soil moisture levels and soil treatment on increase in plant height, increase in number of leaves, date of flowering, rot reading, and root weight. The cuttings, of the variety Barbara Ecke Supreme, were propagated August 30, and 9 hour daylengths were started on October 10. All plants were grown at a pH of 7.

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