# Controlled Flowering of Gloxinias Under Fluorescent Lights

J. W. Boodley and F. F. Horton
Department of Floriculture

Northeastern flower growers usually produce Gloxinias for sale from Easter on through the early fall period. Production of Gloxinias for Christmas or winter sales is not too popular since light intensity and day length are inadequate for good flowering at that time. Gloxinias can be grown and flowered for winter sales if controlled environmental conditions are used.

Two studies were made to evaluate 7 different fluorescent light sources for growing Gloxinias. Previous reports on the effectiveness of these light sources on germinating annual seeds have appeared in NYSFG Bulletins 189 and 206.

General Culture—The experimental area used for both studies was an underground cellar. No natural day light was admitted to the plants. The room temperature was 65-70°F. for the winter flowered crop. In the second study room temperatures during late spring averaged 70-80°. The variety Panzer's Scarlet was used in both studies. The plants were maintained in good cultural conditions throughout the growth of the crop.

Study 1—Seed was sown August 2, 1962, and placed under a common light source (fluorescent, warm white). The seed pans were placed 8 inches from the lights and received a 16 hour photoperiod. On September 11, the seedlings were transplanted to 2¼-inch pots and placed under the respective treatments. There were 10 plants per treatment.

The light sources used consisted of 4 tube commercial reflecting fixtures with 4-foot, 40 watt lamps. Two fixtures, placed side by side, lighted a bench 30 inches wide. The light sources used are listed in Table 1. A greenhouse comparison trial was also used.

Table 1—Light treatments used in Study 1 for production of Gloxinias.

1. Greenhouse (natural day length and intensity)
2. Warm white
3. Cool white
4. Gro-lux I
5. Mark VI
6. Westinghouse Plant gro
7. Natural white and day light, fluorescent lamp combination
8. Warm white and cool white fluorescent lamp combination

The plants were shifted from the 2¼-inch pots to 5-inch clay pots October 25, and remained in these pots until blooming.

On December 12, plants in Treatment 8 were in bloom. Figure 1 shows the condition of the plants in the various treatments on January 6, 1963, at the time they were evaluated. Data taken at this time were fresh weight and number of buds and flowers on each plant. Fresh weight was determined by cutting the individual plants off at the soil line and weighing them. The data presented in Table 2 are the averages for 10 plants in each treatment.

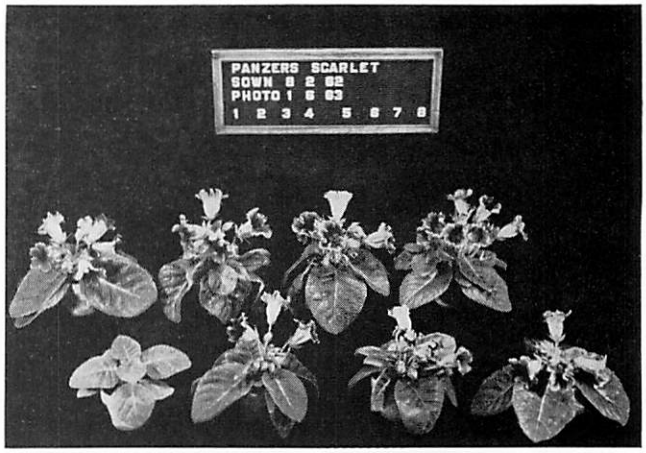


**Fig. 1.** Panzer's Scarlet Gloxinia, study no. 1. Seed sown August 2, 1962, photographed January 6, 1963. Bottom row, left to right, treatments 1 to 4, top row, left to right, treatments 5 to 8.

Table 2—Fresh weight and total number of buds and flowers of Panzer Scarlet Gloxinia grown under 8 light treatments. Average of 10 plants.

| Treatment | F.W. (grams) | No. of buds & flowers |
|---|---|---|
| 1 Greenhouse | 35.2 | 1.1 |
| 2 WW | 149.1 | 26.8 |
| 3 CW | 144.1 | 16.9 |
| 4 GLI | 165.0 | 25.4 |
| 5 Mark VI | 194.5 | 28.5 |
| 6 West. | 178.5 | 19.0 |
| 7 NW & DL comb. | 198.8 | 22.0 |
| 8 WW & CW comb. | 195.8 | 22.0 |

From Table 2 it may be seen that the best treatments on the basis of fresh weight were the combination of natural white and day light, combination warm white and cool white, Mark VI and Westinghouse Plant Gro in that order.

The best treatments on the basis of number of buds and flowers were Mark VI, warm white, Gro-lux I, and the 2 combination treatments were equal. The greenhouse plants were inferior to any of the plants grown under the light sources at the time of the evaluation. Buds were just beginning to form on these plants.

Study 2—From the results of the first crop a second study was made to determine whether the distance of 8 inches from the light source was best or could other distances be used. One additional treatment consisting of a combination of Gro-lux I and Mark VI lamps was used.

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In Table 3 are listed the light treatments used with foot candle intensities for selected lamps. Since the Weston photometer measures light primarily in the visible range which is predominantly green and yellow, foot candle comparisons with other lamps which have predominantly red and blue spectral energies are not valid.

Table 3—Light treatments used in Study 2 and intensities in foot candles[a] of selected fluorescent lamps at different distances.

| Treatment | Intensity 8-inch | 16-inch | 24-inch |
|---|---|---|---|
| 1 Warm white | 1600 | 1350 | 1200 |
| 2 Cool white | 1600 | 1350 | 1200 |
| 3 Mark VI | — | — | |
| 4 Gro-lux I | — | — | |
| 5 Comb. Mk VI and GL I | — | — | |
| 6 Westinghouse Plant Gro | — | — | |
| 7 Combination natural white and day light | 1300 | 1200 | 1100 |
| 8 Combination warm white and cool white | 1400 | 1300 | 1200 |
| 9 Greenhouse (prevailing day length and intensity) | | | |

[a]Foot candles measured with a Weston photometer equipped with a selenium cell.

In this study the seed was sown December 6, 1962, and placed under a common light source as previously described. On January 30, 1963, 6 seedlings were transplanted to a community plastic pack and placed in the specific light treatments. The plants were placed at 8, 16 and 24 inches from the light source. A 16 hour photoperiod was used. Additional greenhouse grown plants were subject to prevailing natural photoperiods and intensities.

The plants were shifted to 4-inch pans March 8, and 5-inch pans April 2. On May 14, photographs were taken and some general observations were made (Figure 2). The general observations showed that the plants farthest from the light source were spindling with leggy stems and frequently had cupped leaves.

On June 4, all of the plants under the artificial light sources were well bloomed. The greenhouse grown plants were not in flower. The artificially lighted plants were harvested as previously described. Fresh weight and total number of buds and flowers were data obtained.

From Table 4 it may be seen that the best growth was obtained at the 8 inch distance from the light source. The poorest growth occurred on the plants that were farthest from the light source. At the 8 inch distance, the 4 best treatments were Mark VI, combination Gro-lux I and Mark VI, combination natural white and day light and the combination warm white and cool white. Three of the 4 are the same light sources that were among the 4 best in Study 1. The combination Gro-lux I and Mark VI was not used in the first study.

The results for average number of buds and flowers from 4 plants per treatment are presented in Table 5. On the basis of bud count the 4 best treatments were combination natural white and day light, combination warm white and cool white, combination Gro-lux I and Mark VI and the Westinghouse Plant Gro. As with fresh weight there was a direct relationship between number of buds and flowers and distance to the lamps. The farther the plants were from the light source the fewer the number of buds and flowers.

Table 4—Fresh Weight in grams of Panzer's Scarlet. Averages of four plants.

| Treatment | Distance from lights 8-inch | 16-inch | 24-inch | Average |
|---|---|---|---|---|
| 1 | 160 | 112 | 108 | 126.6 |
| 2 | 159 | 121 | 103 | 127.6 |
| 3 | 188 | 141 | 116 | 148.0 |
| 4 | 141 | 138 | 97 | 125.3 |
| 5 | 179 | 129 | 144 | 150.6 |
| 6 | 153 | 160 | 101 | 138.0 |
| 7 | 172 | 174 | 141 | 162.3 |
| 8 | 164 | 142 | 116 | 140.6 |
| Avg. | 164.5 | 139.6 | 115.7 | |
| 9 (grnhouse) | — | — | — | 385.3 |

The greenhouse grown plants were harvested July 10, 1963. The average weight of 4 plants was 385.3 grams. This weight was 200 grams heavier than the average of the plants in the best fluorescent light treatment. The average number of buds and flowers was 106, five times more buds than on any of the plants under the light treatments. The significance of the increased weight and greater number of buds and flowers on these plants cannot be overlooked. The plants did require greater than one month to reach full flowering as compared to the lighted plants.

The results of these studies have shown that good quality, saleable, 5-inch Gloxinias can be produced in an artificially lighted environment. The time required was approximately 154 days from sowing seed to full flower. Five different fluorescent light sources were similarly efficient in providing energy for satisfactory growth. With a 16 hour photoperiod the best growth was obtained when the plants were placed 8 inches from the light source.

Table 5—Average number of buds and flowers, averages of four plants.

| Treatment | 8-inch | 16-inch | 24-inch | Average |
|---|---|---|---|---|
| 1 | 18.0 | 8.5 | 8.7 | 11.7 |
| 2 | 17.7 | 11.5 | 10.2 | 13.1 |
| 3 | 17.5 | 9.5 | 6.0 | 11.0 |
| 4 | 11.5 | 10.2 | 7.5 | 9.7 |
| 5 | 19.5 | 13.5 | 19.0 | 17.3 |
| 6 | 19.0 | 16.2 | 9.2 | 14.8 |
| 7 | 21.5 | 18.7 | 10.7 | 17.0 |
| 8 | 19.7 | 17.5 | 12.2 | 15.8 |
| Avg. | 18.0 | 13.2 | 10.4 | |
| 9 (grnhouse) | — | — | — | 106 |

Greenhouse grown plants did not flower in the first study. In the second study greenhouse grown plants required 5 additional weeks to reach full bloom. However, the fresh weight and number of buds produced on the greenhouse plants was greatly superior to that of the plants under the fluorescent light sources.

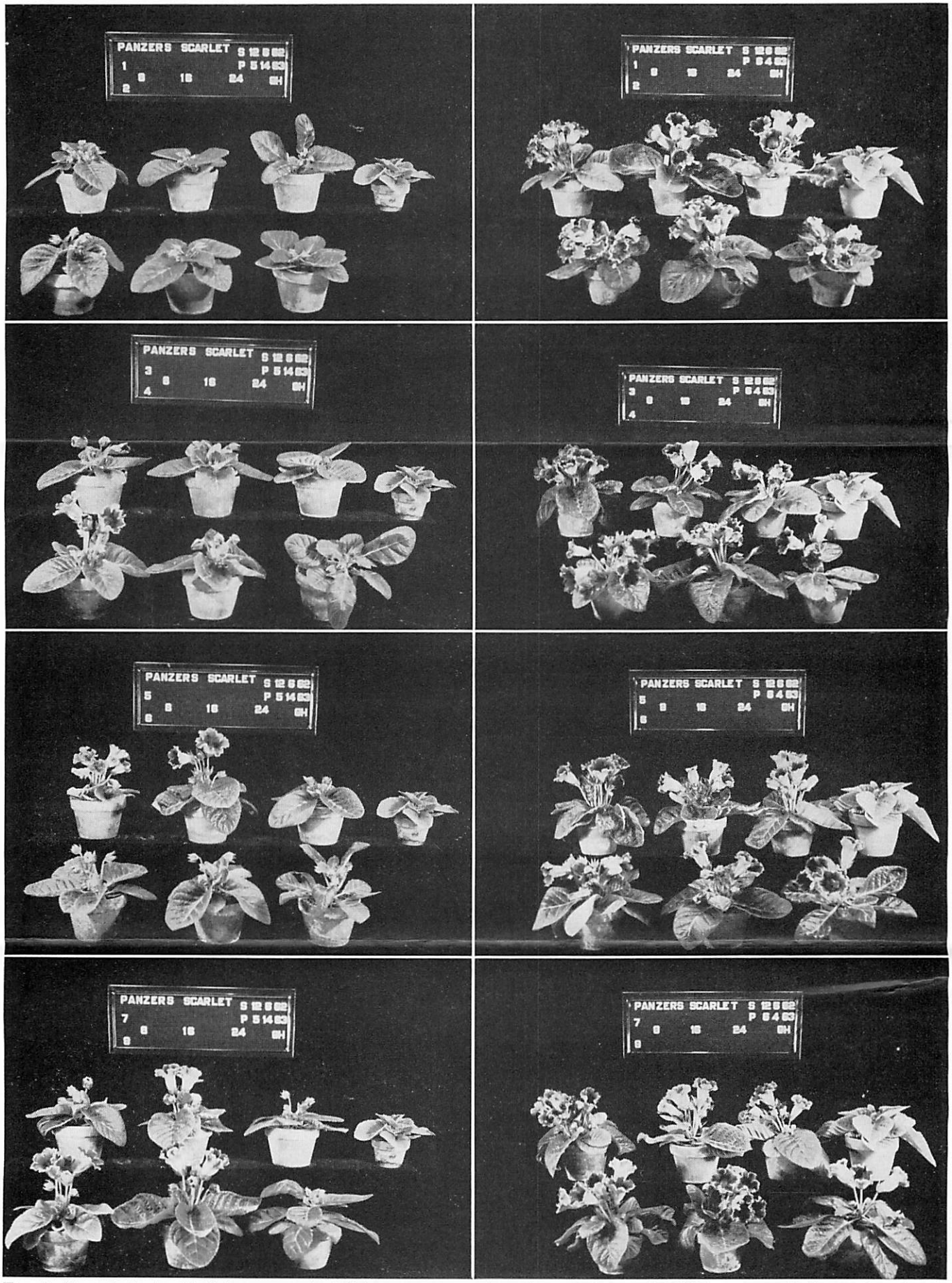


**Fig. 2.** Panzer's Scarlet Gloxinia grown under 9 light treatments, at three distances from artificial light sources. Seed sown December 6, 1962. Left, top to bottom, photographed May 14, 1963; right, top to bottom, same plants photographed at time of harvest, June 4, 1963.