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CONTROLLING POINSETTIA FLOWERING

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In the past, many growers did very little to control the flowering date or quality of the poinsettia. A night temperature of 62° was maintained, with the day temperature approximately 10 degrees higher. The grower relied on a natural daylength for flower bud initiation and development. Recent work has shown, however, that the commercial poinsettia grower, to produce plants of maximum quality for Christmas, should control both the temperature and daylength.

Daylength

A daylength of 12 hours or more will keep a poinsettia vegetative, whereas one of less than 12 hours will cause it to flower. The natural bud initiation date or the date when the daylength is short enough to initiate flowers is about October 10 in New York State. Figure 1 shows the daylength curve from September 21 to December 21.

A lighting set-up similar to that used for chrysanthemums or slightly less intensity (a minimum of 3 foot candles) is satisfactory. The lights should be turned on for about two hours in the middle of the night (11:00 pm to 1:00 am).

There have been a few who claim that the lights "stretch" the plants. This is not true. What happens is that the plants remain vegetative for a longer period and there is more growth and perhaps taller plants; however, the growth is not weak or soft. To offset the additional growth, the propagation dates should be shifted about 7 to 10 days later for the single stem crop and in the case of the pinched crop to make the pinch about seven days later. The result will be a crop of the same height, and a more accurate flowering date. In addition the height of the plants can be more accurately forecasted.

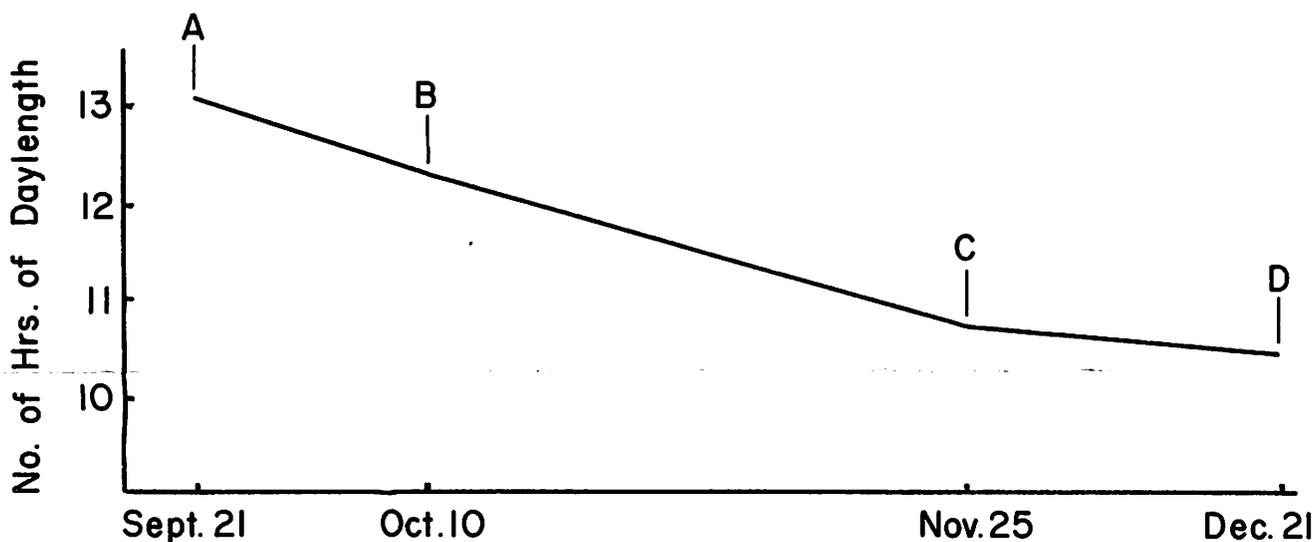


Figure 1. Shows the natural daylength curve from September 21 until December 21. A—is the time that artificial light should be applied. B—is the date at which lighting should be stopped, the natural bud initiation date and the time when black cloth should be applied. C—is the date it is no longer necessary to pull black cloth and D—is the date the plants should be salable.

Figure 1, however, is the theoretical daylength curve and does not take into account the variations due either to bright or cloudy weather, which may be local or wide spread. For example, if the first 10 days of October were dark and rainy the daylength would be affected and consequently the bud initiation date. The end result would be a crop that was 10 days early. Earliness is a common occurrence; however, it can easily be prevented by applying lights to the crop from September 20 until October 10.

The reverse situation to early flowering is also possible, i.e., if October were very bright up to the 20th then the crop would be 10 days late for Christmas. Lateness can be prevented by covering the crop with black cloth on October 10 and continuing to cover for at least two weeks. There are other ways to overcome this problem and they will be reviewed later.

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Poinsettia Flowering (continued from page 1)

In addition to daylength controlling the flowering of the poinsettia there has been some very good evidence to show that the length of day affects the size of bract and speed of maturity. Experiments have been run where the plants were grown at daylengths of 8, 9, 10, 11 and 12 hours, and it was evident that the poinsettias in the 8 hour treatment were shorter and matured faster than the other treatments. It was shown that the 9 hour treatment flowered faster than the 10 hour and the 10 hour faster than the 11 hour treatment. If we again review Figure 1 it can be seen that for the first month (October 10-November 10), which is the most critical time, the daylength varies from about 12 hours to 11 hours. Therefore, we strongly recommend that a small portion of this year's crop be treated with black cloth. The crop should be lighted from September 20 to October 10 and then the black cloth treatment should be started. The black cloth should be applied about 5:00 pm and removed about 8:00 am. The treatment should be continued until Thanksgiving. (In making this trial be sure to include a few pans from all of your propagations so that a comparison can be made before the plants are sold.)

Temperature

Temperatures, both day and night, also play an important part in the speed of maturity and quality of the poinsettia.

It must be noted in the work about to be discussed that four temperatures were used: 50°, 60°, 70° and 80°F. The plants, variety Barbara Ecke Supreme, were moved two times a day to get all of the possible combinations of day and night temperature, i.e., there were treatments at 50° night—50° day, 50° night—60° day, 50° night—70° day, 50° night—80° day, etc. Also in some cases it is necessary to include daylength, because there is a very definite relationship between temperature and daylength. In other words, the temperature can change the daylength requirement. To cite an example—two groups of poinsettias were grown at a temperature of 80°F night and day. One group was grown with a natural daylength and the other with a 9 hour daylength. The natural daylength plants never flowered; however, the 9 hour daylength plants flowered around the middle of December. Therefore, if you were to grow poinsettias at 80° F it would be necessary to pull black cloth to flower the crop.

Night Temperature

The work to be reported here, as mentioned previously, was divided into four night temperatures: 50°, 60°, 70° and 80°F. The 50° and 80° temperature can be discounted as not commercially feasible. The 80° night temperature is too expensive to maintain and in addition, the quality was poor. The 50° night temperature was undesirable because the crop was too slow to develop, too prone to root rot organisms and the quality was poor.

The best quality plants were obtained with the 60° and 70° night temperatures. The 70° night temperature was superior because it matured faster, generally had more and larger bracts and was less affected by disease.

Table 1 shows the number of days from the start of

short days (October 10) until the first stamens showed (salable). Figure 2 shows the plants as they looked on December 21.

Table 1. Number of days from start of short days (October 10) until the first stamen (salable).

	Day Temperature							
	Natural Daylength				9 Hour Daylength			
	80°	70°	60°	50°	80°	70°	60°	50°
70° night	56	60	66	76	47	56	60	66
60° night	66	76	80	83	60	76	80	83

Figure 2 (A, B) illustrates the influence of the day temperatures when the plants were grown at 70° night (A), and 60° night (B) with a natural daylength. Figure 2 (C, D) indicates the effects of the day temperature when the plants were grown at 70° night (C) and 60° night (D) with a 9 hour daylength. To observe the effect of the night temperature compare the 70° night (A, C) with the 60° night (B, D).

Day Temperature

The day temperature does play an important part in the speed of maturity of the poinsettia as is shown in Table 1 and Figure 2. With any night temperature, the higher the day temperature the faster the crop will mature. This fact can be utilized by growers who have trouble maintaining warm night temperatures, if the crop has been delayed or for very late propagations. Use, for example, a 60° night temperature and natural daylength. If the day temperature is 60°, the plants will mature in about 80 days. Raise the day temperature 10° to 70° and the crop will mature in about 76 days. If the day temperature is raised to 80° the crop will mature in about 66 days or two weeks earlier than the 60° day temperature.

Black cloth will also help to speed up the maturity of the crop. In the above case, it took 66 days for the crop to mature at temperatures of 60° night and 80° day. If black cloth were applied, using the same 60°-80° temperatures, it takes about 60 days for flowering.

The differences in rate of maturity can be observed in Figure 2, when the plants were grown under a nine hour daylength (C,D) as compared to a natural daylength (A,B). The rates of maturity of the daylengths are also shown in Table 1.

Summary

This past fall we carried on an extensive project on the effect of temperature and daylength on the poinsettia. All of the problems were not solved; however, we do know that temperature, both day and night, can be used to control flowering.

The best night temperatures were 60° and 70°. The best day temperatures were 70° and 80°. Table 2 gives the most desirable combinations of temperatures and daylength.

Table 2. The number of days to flower the variety Barbara Ecke Supreme after the start of short days with three temperature combinations and two daylengths.

	Natural Daylength		9 Hour Daylength	
	60°-70°	76	76	76
60°-80°	66	66	60	60
70°-70°	60	60	56	56

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Figure 2. Illustrates the influence of day (50°, 60°, 70°, and 80°) and night (60° and 70°) temperatures and two daylengths (natural and nine hour) on the flowering of the poinsettia var. Barbara Ecke Supreme. The plants shown were started under the various treatments on October 10 and the photographs were taken December 21.

Poinsettia Flowering (continued from page 2)

In other words, any of these combinations would give good quality plants. For trials we are recommending that a portion of your crop be black clothed. We are also recommending trials of the various temperature combinations. A majority of the growers are using the 60°—70° combination (see Poinsettia Survey). If you have an area where a 60°—80° or 70°—70° temperature combination could be used, we recommend that a few pans from each of your propagations be placed at these temperatures.

Poinsettia Survey

In December, 1957, a preliminary survey on poinsettia cultural practices was conducted through the cooperation of the New York State poinsettia growers and this department. The following information was desired; night temperature, day temperature, height desired, whether or not additional light was given and on what dates the lighting was started and stopped, whether or not the grower pulled black cloth, propagation dates, and the stage of maturity desired by the grower on December 15.

The answers obtained from this survey indicate that the average night temperature maintained is 62 degrees, and the average day temperature is 72 degrees. The average desired height is 22 inches. One third of the growers who replied were using additional lights, and the duration of lighting was from September 20 to October 10. Only ten per cent of the growers were pulling black cloth. The earliest propagation date was June 10, and some growers continued to propagate until October 5. However, the majority of the growers began propagating poinsettias in late June or early July, and stopped propagating in mid-September.

The remarks relating to the maturity desired by December 15 were varied. Some greenhouse operators wanted the plants to be "fully ripe" at this time, with pollen showing, while many growers favored plants which showed good bract color and development but had no pollen showing.