

PHOTOPERIOD CONTROL

Within the last several years there have been many new growers coming into the floricultural industry. Often these folk are unfamiliar with the methods used to control photoperiod, or the length of day, to promote or prevent flowering. Therefore, this brief paper will attempt to explain how to control photoperiod.

First of all, know the photoperiod requirements of your crop. You may not have to employ photoperiod control—but if you do, do it correctly. If you need help or have questions, your local Cooperative Extension Agent or salesman should be able to help. Also, fail not to refer to "Bud initiation and development" in "Cornell Recommendations for Commercial Floricultural Crops—Part I." Another good reference is in the chapter on "Light and Photoperiod" authored by R. W. Langhans in the "Chrysanthemum Manual."

How to Lengthen the Day

Research over the years has shown that providing about four hours of light from incandescent lamps in the middle of the night (10 p.m. to 2 a.m.) will cause many plants to respond as if they were growing under the long-day conditions of summer.

The system used to lengthen the photoperiod should provide 10-20 ft-c at the tops of the plants. Experience has shown that in lighting greenhouse or outdoor areas $1\frac{1}{4}$ to $1\frac{1}{2}$ watts per square foot should be used. This includes walks as well as growing areas. For beds, 3.5 to 4.0 feet wide, 60-watt incandescent lamps in clean reflectors, spaced four feet apart and three feet above the tops of the plants or 100-watt incandescent lamps in clean reflectors, spaced six feet apart and four to five feet above the tops of the plants are satisfactory. Remember, as the crop continues to grow, the lamps should be raised as well. If this task becomes burdensome, the lamps can be placed higher in a fixed location, but . . . be sure at least 10 ft-c of light are at the tops of the plants. The use of a light meter can be an aid here.

Most lighting installations use two plastic-coated No. 14- or 16-gauge electric wire strung over the plants to be lighted. Electrical "pin sockets" in which the lamps are inserted are attached to the electrical wires. These can be easily removed later if desired.

Connecting this system to a 24-hour time clock to activate and deactivate the system at 10 p.m. and 2 a.m. respectively will provide long-day growing conditions for your plants.

Some cautions:

1. Don't overload the system.
2. Manually turn the lights on every couple of days to ensure all lamps are working.
3. Tighten "on" "off" adjustable tabs so they don't loosen or fall off the clock dial.

As an energy saver . . . intermittent or cyclic lighting to simulate the long-day effect can be used. Here, lights are on only ten to twenty percent of the lighting period (i.e. six minutes of light alternating with 24 minutes of dark). In areas where demand meters are used to measure electrical usage, the greatest benefits may result. **BUT**, this system allows little or no room for errors as variety response, reduced voltage, equipment failure, improper spacing of lamps, etc. We suggest if you desire to use cyclic lighting, first do this in a limited way to gain experience.

How to Shorten the Photoperiod

At certain times of the year the length of the natural day is too long for plants that have a short daylength response. To provide a short day, plants are darkened from approximately 5 p.m. to 8 a.m. each day. To darken or artificially shorten the daylength, a black sateen-cloth, black poly, or similar material is pulled over a framework constructed of wires and pipes or wood. Some of the newer automatic black cloth systems or energy curtain systems used in greenhouses should be considered too.

Some considerations:

1. The entire crop needs to be totally darkened.
2. Light leaks cannot be tolerated or crops will be delayed, or not flower.
3. The temperature under the system must be watched. Temperatures too high will cause heat-delay.
4. Use a good quality covering.

Some References

For your reference and further reading concerning photoperiod control, you may wish to refer to the following:

"Greenhouse Management" by R. W. Langhans, Halcyon Press, 239 p.

"Chrysanthemum Manual" edited by R. W. Langhans.

"Cornell Recommendations for Commercial Floricultural Crops—Part I."

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