University of Minnesota Easter Lily
Research Report: Paper No. IX

Lighting Lilies at Shoot Emergence
Night Interruption Shown to be Most Effective

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Researchers and commercial men have long attempted to accelerate growth of the Easter lily by providing supplemental light at night. Lighting was applied when it was evident that the crop was behind schedule. Such attempts were not particularly successful. Lighting normally accelerated flowering from 7 to 10 days. However, these plants were taller and frequently had fewer flowers. The conclusion was that higher forcing temperatures were the only successful means of accelerating a slow crop.

However, in 1967 Waters and Wilkins (1) published data showing that shoots from non-cooled 'Georgia' bulbs responded to lighting. Wilkins *et al.* (2,3) demonstrated that the 'Ace' and 'Nellie White' cultivars were also responsive to lighting. A practical commercial application was devised and published as an "insurance policy" (4,5).

The "insurance policy" requires that the plants be illuminated at 15 to 30 foot-candles from 10 p.m. to 3 a.m. (5 hours) for two weeks immediately upon shoot emergence in order to achieve the effective long-day (LD) flowering response. Shoots from properly cooled bulbs are not responsive to this early LD treatment. Shoots from inadequately cooled bulbs are responsive to LD's and later will respond as a properly "cooled" plant and flower on schedule. There appears to be a day-for-day substitution of long-days for the cold treatment.

Since non-cooled or inadequately cooled bulbs eventually will flower when grown at 60°-65° F., this temperature regime may be considered a "slow" cold temperature treatment. Hence, by the time a forcer realizes that his

plants are late for Easter, the bulbs have had their cold requirement fulfilled, but at a very slow rate. Thus, LD treatments given to large plants and applied late in the forcing schedule were not really effective.

Numerous commercial firms adopted the "insurance policy" as a routine practice in the 1969-70 forcing season. However, because of limited power supply, the question was asked, "Can the LD treatment be used other than as a night interruption from 10 p.m. to 3 a.m.?" An experiment was conducted to determine if lighting was as effective from 4 p.m. to 8 p.m., and from 4 a.m. to 8 a.m. as it was from the recommended 10 p.m. to 3 a.m. period. The results are shown in Table I.

The conclusion reached was that the most effective period is the middle of the night interruption treatment. In addition, the data shows that lighting from 4 p.m to 8 p.m. was somewhat less effective; lighting from 4 a.m. to 8 a.m. was the least effective.

At this time little is known about cyclic lighting of the Easter lily.

Table I. The effects of incandescent light treatments given at three periods to newly emerged shoots of 8-9 inch 'Nellie White' lilies. Shoots were from non-cooled bulbs, and treatments were for 30 days. All plants received eight hours of natural light conditions. Intensity of light treatment was 35 foot-candles.

	Period of Treatment			
	4 p.m.- 8 p.m.	10 p.m.- 2 a.m.	4 a.m.- 8 a.m.	No Lights
Flowering Date	4/19	3/28	4/8	5/21
Flower Number	7.0	6.1	7.0	11.0
Height (cm)	28.5	37.8	34.2	21.8
Number Leaves	104	90	90	125

References

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2. Wilkins, H.F., W.E. Waters, and R.E. Widmer. 1968. The effect of carbon dioxide, photoperiod and vernalization on flowering of Easter lilies, (Lilium longiflorum, Thunb. 'Ace' and 'Nellie White'). Proc. Amer. Soc. Hort. Sci. 93:640-649.

3. Wilkins, H.F., R.E. Widmer, and W.E. Waters. 1968. The influence of vernalization and photoperiod on floral induction of Easter lilies, (Lilium longiflorum, Thunb. 'Georgia', 'Ace', and 'Nellie White'). Proc. Amer. Soc. Hort. Sci. 93:650-654.

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