

Photoperiodic Lighting Techniques



Type of Lamp & Recommended Spacings

1. Incandescent

Spacing recommendation for 0.5 W/m^2
PAR:

2. Tubular Fluorescent Lamps

Lamp Power W	Height (above plants) m	Spacing (either way) m	Area / Lamp m^2
60	0.6-0.9	1.2	1.4
100	1.2-1.4	1.8	3.2
150	1.5-1.8	3.1	9.6

Spacing recommendation for 0.5 W/m^2
PAR:

Lamps ranging from 40 - 100 W placed end-to-end in rows spaced at 4.5m apart at a mounting height of 2.7 - 3m above the crop canopy. The outer rows should not be more than 2.5m in from the outer edge of the lit area.

3. 18W SLR Compact Fluorescent Lamps

Spacing recommendation for 0.5 W/m^2
PAR:

Lamps placed at 1.5m either way giving an area of approximately 2.3 m^2 per lamp. Lamps should be mounted at 1.2m above the crop canopy.

Cyclic Lighting

Recommended for Chrysanthemum, Poinsettia and Gypsophila only. On/off ratio should not be more than 1:4. For species less sensitive to day/night ratio the recommendation is 1:1 on/off. Complete on/off cycles of between 10 and 30 minutes are normally recommended.

(Note: Fluorescent lighting is not normally suited to cyclic lighting but could be feasible if the switching interval is not less than 15 minutes).

Treatments

1. Chrysanthemum (inhibiting flower-bud initiation)

At around midnight or 2400 hours onwards:

Month	Period (hours)
September	2
October	2
November	3
December	4
January	4
February	3
March	2
April	2

“Interrupted” lighting for Chrysanthemums

This technique must not be confused with “cyclic lighting”. It is used to improve flower quality and control the type of spray produced in spray production by reintroducing a 7 - 10 day period of long days at approximately week 2 of short days. This programme reverts to normal short days after this treatment.

2. Poinsettia (inhibiting flower-bud initiation)

At around midnight or 2400 hours onwards:

Month	Period (hours)
September	2
October	2
November	3
December	4
January	4
February	3
March	2
April	2

3. Kalanchoe (inhibiting flower-bud initiation)

At around midnight:

Month	Period (hours)
September	2
October	2
November	3
December	4
January	4
February	3
March	2
April	2

Cyclic lighting at an interval of 6 minutes in every half hour at not less than 100 lx.

4. Rieger Begonia (inhibiting flowering and encouraging vegetative development)

At around midnight:

Dates	Period (hours)
September 1-15	1
September 16-30	2
October 1-15	3
October 16-31	4
November 1-15	5
November 16-30	6
December 1-15	7
December 16-31	8
January 1-15	7
January 16-31	6
February 1-15	5
February 16-28	4
March 1-15	3
March 16-31	2
April 1-15	1

5. Zygocactus (inhibition of flower-bud initiation)

Night-break 2300 - 0300 hours. From mid-September to early April.



6. Celery (inhibiting premature "bolting")

Night-break 2200-0200 hours. From planting out to 21 March.

Note: In order to be fully effective air temperatures should not fall below 12°C.

7. Carnation (promoting flower-bud initiation to produce a "flush" of buds)

Lighting from dusk-to-dawn (effective 24 hour day).

Maximum period of lighting - 4 weeks.

Lighting from	To flush
Mid January	May/June
Mid February	June
Mid March	June/July
Mid April	July
Mid May	August/September
Mid August	November/December
Mid September	January/February
Mid October	March
Mid November	April
Mid December	April/May

9. Miscellaneous applications (promotion of flowering to extend flowering season)

(See table on next page)

8. Strawberry (encouraging earlier flowering/fruitletting for greenhouse-grown crops)

Daylength extension (midnight-dawn) at 1.5W/m² PAR from planting out to start of cropping. Minimum set temperature during period over which the lighting treatments are given should not be less than 10°C.

Species	Irradiance (PAR) W/m ²	Treatment	Time of Year	Purpose
Alstroemeria	0.2 - 0.4	Night-break 2300 - 0200h	Mid December to March (lighting must not start until the plant is established and growing properly)	Improving flower production for cutting in the early spring period.
Calceolaria & Cineraria	0.4 - 0.8 (fluorescent)	Night-break 2300 - 0700h	November to February (following flower-bud initiation which is stimulated by a period of low temperature 10°C)	Promoting earlier flowering January/February
Campanula isophylla	0.4	Night-break 2300 - 0700h	November to March	Promoting earlier flowering
Fuschia	0.8	Night-break 2300 - 0100h	October to March	Extending normal flowering into late autumn and earlier flowering in spring (January/February)
Gypsophila paniculata	0.2 - 0.4	Daylength extension dusk - midnight	October to April	Promoting of better flowering stems for cutting - through the winter months
Regal pelargonium	0.4	Night-break 2300 - 0100h	December to April (treatment must be preceded by a period of short days at a low temperature, 10 - 1 3°C)	Promoting earlier flowering (early April)