

Care of House and Garden Plants

Artificial Lighting of Plants Indoors

Cooperative Extension Service Michigan State University



by
Richard F. Stinson
Department of Horticulture

Contemporary buildings and homes frequently have plants as part of the indoor decoration. Often these plants have been placed in positions of inadequate natural light, and artificial light must be furnished in order to get satisfactory growth of the plants. Questions frequently asked on this subject involve the kinds of lamps to be used, the placement of the lamps, the duration of lighting, and the kinds of plants suitable for artificial light.

Kinds of Lamps

For most purposes, incandescent lamps provide the right kind of light rays (portion of the light spectrum) for healthy growth of foliage plants. However, when one wishes to provide a higher light intensity (300 foot-candles) for flowering plants such as African Violets, Gloxinias, and Fibrous-rooted Begonias, it is best to use fluorescent tubes because they do not give off as much heat (infrared) as do the incandescent lamps at short distances. These heat rays cause distorted growth of the plants. When using fluorescent tubes, it is best to use half "Daylite" tubes and half "Soft White" tubes to provide a suitable balance of different portions of the light spectrum.

Fluorescent tubes are now available that provide the full range for growth, but they are more costly than covering the same space with a similar spectral distribution from the two kinds of fluorescent tubes indicated above. Only warm-white tubes should be used for seed germination.

Placement of Lamps

The lamps should be placed directly over the plants at a distance that will provide

adequate light intensity for the growth of the plants. In general, foliage plants may be expected to grow well for years if provided with 150 to 200 foot-candles of light.

For lighting tall, medium, or short-growing plants in a large room, a 150-watt projector flood lamp should be placed about 10 feet above the rim of the plant container. This floor lamp will provide adequate lighting for indoor foliage plants in a 5-foot circular pattern directly under the center of the lamp. In more confined spaces, 200-watt incandescent lamps, with reflectors, may be used for lighting medium to short growing foliage plants. In this case, the pot-to-lamp distance should be four feet.

With incandescent lamps, distances of less than four feet from the pot rim may result in distorted growth because of the heat rays. For small flowering plants, fluorescent fixtures may be placed twelve inches above the pot rims. The effectively lighted area extends about two inches beyond a line directly under the edge of the fluorescent lamp reflector. A shelf or two of a bookcase can often be easily illuminated with fluorescent tubes for growing flowering plants.

Duration of Lighting

It is difficult to artificially achieve light intensities as high as those at which plants grow best under natural illumination, but it is possible to compensate for this by exposing the plants to artificial light for longer periods. Some plants grow very well under continuous illumination, but many of them grow best if the light is interrupted during a twenty-four hour period. From sixteen to eighteen hours of light per day seems adequate for most indoor

plants. For large scale plantings in business buildings, a time clock could be used to turn the lights on and off. Perhaps the easiest way to do this in a home is simply to turn on the lights when one rises in the morning and turn them off before retiring at night.

Some Suitable Plants

Foliage plants (150 to 500 foot-candles, incandescent lamps.)

Tall (2-6 ft.): Norfolk Island Pine, Rubber Plant, Fiddle-leaf Fig, Kentia Palm, Philodendron pertusum, Schefflers.

Medium (1-3 ft.): Chinese Evergreen, Cast Iron Plant, Snake Plant, Boston Fern, Fatshedera, Dracaena warneckeii, Dracaena sanderiana.

Short (1 ft. and less): Peperomia, Variegated Peperomia, Pick-a-back plant.

Vines: English Ivy, Grape Ivy, Pothos, Philodendron.

Flowering Plants: (300 foot-candles, fluorescent lamps) African Violet, Gloxinia, Begonia, Episcia.

Germination of Seeds

Seeds of annual flowers and vegetables germinate rapidly and uniformly under artificial illumination. The seeds should be sown in pots or other containers in the usual way. Only warm-white tubes should

be used for this kind of growing, and the tube-to-container-edge distance in this case should be six inches. It is important that the temperature be maintained at 65° to 70°F. during the germination period. The lamps should be operated for about 16 hours per day. Seedlings should be transplanted to a spacing of about 1½ inches apart as soon as the true leaves are expanded, and may continue to be grown to planting-out size under this light source. Young plants grown in this way may be exposed to full sunlight without danger of damage to the foliage.

References

Davidson, O. W. March-April, 1954. *Foot-candles and green plants*. New Jersey Agriculture 36(2):6-8. Agl. Exp. Sta., Rutgers University, New Brunswick, N. J.

Ditchman, J. P. Jan., 1955. *Light for plant growth*. L. S. 168. General Electric Co., Lamp Div., Cleveland 12, Ohio.

Schultz, P. 1955. *Growing plants under artificial light*. Mr. Barrows and Co., Inc., Publishers, New York.

Stoutmeyer, V. T. and Albert W. Close, March, 1946. *Plant propagation under artificial light*. U.S.D.A. Leaflet. Bur. Plant Industry, Beltsville, Md.