LIGHT: An Introduction

Light more than any other cultural factor contributes to success in growing gesneriads. It is abolutely essential for plants to grow and bloom well. Every grower needs to understand, and provide for the general light requirements of the various genera they are growing or thinking of growing.

In their native habitats gesneriads have adapted to vastly different amounts or intensities of light. Gesneriads living at ground level in tropical rain forests flourish in total shade whereas those gesneriads living epiphytically within the forest canopy flourish in dappled light, i.e., alternating periods of sunlight and shade, while those gesneriads which have adapted to more open ground are living in almost full sunlight. Knowing each of your gesneriads and their specific light requirements is very important.

Streptocarpus and episcia are considered "low light" gesneriads .

TYPES OF LIGHT

Most gesneriads are considered "long day" plants, i.e., they require a substantial amount of good quality light for blooming to be initiated as opposed to "short day" plants such as chrysanthemums and Christmas cacti which require diminishing amounts of light to initiate blooming. Gesneriad "long day" light requirements or intensities can be divided into three very general exposure categories: low light, medium light and strong or high intensity light.

Most gesneriads are considered "long day" plants in that they require a substantial amount of good quality light for blooming to be initiated.

"Low light" gesneriads grow almost exclusively in total shade and most, if not all, originate at or just above ground level in tropical rainforests. These include, for instance, saintpaulia, streptocarpus, chirita, and episcia.

"Medium light" or dappled light requiring gesneriads include not only those naturally growing throughout the various levels of the rainforest canopy but also those which grow under alternating periods of sunshine and shade throughout each day. "Medium light" gesneriads include columneas, dalbergarias, nematanthus, aeschynanthus and codonanthe.

Gesneriads which require strong or "high light" intensities are those gesneriads which have successfully evolved to live and thrive in areas receiving fairly extreme or high intensity light with little or no shade, e.g., grasslands, savannahs, or exposed cliff or rock faces. These include, for example, kohlerias, sinningias, and achimenes.

SOURCES OF LIGHT

There are two sources of light: natural and artificial. Natural light comes from the sun while artificial light comes from "man made" sources, e.g., fluorescent lights, halide and incandescent bulbs.

The brightness of a light source and the amount of visible light emanating from it is traditionally measured in footcandles. Instruments such as photographic light meters can be used to measure footcandles.

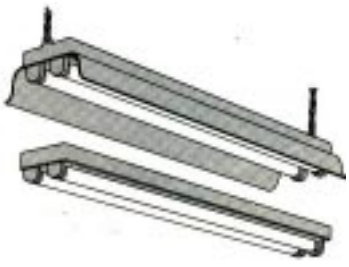
Aeschynanthus is considered a "medium to high light" gesneriad.

NATURAL LIGHT

Natural light is best and most easily discussed in terms of directional exposures, i.e., eastern, northern, western, and southern or combinations thereof. The amount of light that enters a window depends on which exposure or point of the compass it faces. In the northern hemisphere, windows having a southern exposure, i.e., facing south, receive several hours of direct sunlight on clear days while windows facing

A plant growing 2 feet from a window will receive considerable less light than one stationed only a foot from the window .

Fluorescent light is without doubt the best artificial light source for gesneriads



Fluorescent lights come in reflector housings or strip arrangements.

north receive no direct sunlight. It should be noted that the amount of light received through a window and available to a plant diminishes at a rapid rate as the distance between the plant and the window increases, e.g, a plant growing 2 feet from a window will receive considerably less light than one stationed only a foot from the window. The selection of which directional exposure should be utilized for growing gesneriads will vary with the time of year, and type of gesneriad being grown.

"Low light" gesneriads, for instance, do best in a northern to north-eastern exposure from May until September while enjoying either an eastern or western exposure for the remainder of the year. "Low light" gesneriads can be grown in a eastern or western exposure the entire year, but protection or shading, in the form of blinds, should be used to prevent strong light from burning foliage and blossoms — generally speaking, "low light" gesneriads should not be exposed to more than a half hour a day of direct or unfiltered sunlight.

Gesneriads with "medium light" requirements are more than happy to grow in either a western or eastern exposure for the entire year but as with "low light" gesneriads some shading through the use of blinds may be required for extremely bright or hot days — a maximum of two hours per day of direct sunlight is generally required for "medium light" gesneriads to grow and bloom well.

"High light" gesneriads will thrive in either a southwestern or southeastern exposure throughout the year. These types of gesneriads, although they require high amounts of intense light, should not be subjected to more than two to three hours a day of unfiltered or direct sunlight during the months of June, July and August.

ARTIFICIAL LIGHT

There are three basic sources of artificial light: incandescent filament light bulbs, mercury-vapour or halide lights, and fluorescent lights. The use of either mercury vapour lights or incandescent bulbs is not recommended for growing gesneriads in the average home. Not only do both types of light have high operating costs, but each comes with its own set of safety issues & hazards: potential fires in the case of the heat generating halide lights, and nerve-wracking explosions in the case of water spattered incandescent bulbs. Fluorescent light is without a doubt the best artificial light source for gesneriads: it is cheap, safe, and energy efficient.

FLUORESCENT LIGHT

It was no accident that the popularity of gesneriads, especially saintpaulia, coincided with the introduction and development of the fluorescent tube and fixture. That the first tubes produced less light and gesneriads, more so than any other flowering plant family, took to it has made gesneriads the most successful plant family ever grown under artificial light.

Undoubtedly fluorescent tubes provide the best kind of artificial light for gesneriads. They produce much more light per watt, and they waste less of their energy in producing heat.

Fluorescent lights come in a variety of shapes, colours and sizes. Lengths vary from 8 to 96 inches and although the tubes are normally straight, they are also manufactured in 8 and 10 inch circular or circline sizes. In addition, fluorescent lights come as ready made fixtures which can accommodate anywhere from 1 to 4 tubes in parallel positions. These fixtures are available either in reflector housings usually hung by chains or as strip arrangements, i.e., without reflectors, designed for fastening directly to an upper surface.

The basic and most effective equipment required for growing gesneriads is either a 40 watt fixture which holds one ballast operating two 48 inch fluorescent tubes or an 80 watt fixture which holds two 40 watt ballasts operating two tubes each for a total of four 48 inch tubes. (A simple growing set-up has one or more of these suspended over tables or benches.) These ready-made fixtures which accommodate 2 or 4 parallel tubes, 34 to 40 watts each, are most commonly sold through home construction centres as "shop lites". If at all possible and to maximize the distribution of light, a suitable fixture should also include a reflector. Two tube fixtures are considered suitable for growing "low light" and some "medium light" gesneriads while four tube fixtures are considered suitable for growing some "medium light" gesneriads and all "high light" gesneriads.

Sinningia is considered a "high light" gesneriad.

TYPES OF FLUORESCENT LIGHTS

Of all the colours of the spectrum, two — blue and red — are the most important for gesneriad growth. To be thoroughly effective, fluorescent light must give out adequate amounts of each. Six common fluorescent lights or tubes currently on the market include cool white, warm white, white, daylight, natural, and soft white. In addition, there are costly "wide spectrum" tubes available which have been specifically designed to assist plant growth, e.g, GroLux, Verilux.

Of the six common fluorescent lights available, cool white is the cheapest and most commonly used for growing gesneriads. If cost is no option, having fixtures outfitted with either warm white tubes in combination with cool white tubes, or all wide spectrum tubes is also highly recommended.

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With energy efficiency currently a factor for operating anything electrical in the home, most fluorescent light tubes now come in energy saving 34 watt capacities. Experience has proven that the reduced wattage of these types of tube has little or no effect on plant growth, i.e., whether the tube wattage is 40 or 34, gesneriads grow well. A cautionary note on the use of 34 and 40 watt tubes: if a ballast supports a "normal" 40 watt tube, it will also support a 34 watt tube; however, if a ballast supports only a 34 watt or energy efficient tube, it will not support a 40 watt tube.

A "must have" for every gesneriad grower using artificial light is an appliance timer.

DISTANCE, DURATION AND QUALITY OF LIGHT

For most gesneriads, twelve to sixteen hours of continuous fluorescent light is more than sufficient to produce abdundant bloom: "low light" gesneriads will require no more than 12 hours, "high light" gesneriads will require 14 to 16 hours, and "medium light" gesneriads will adjust and grow well in any amount of available light between "high" and "low" levels.

Essential for efficient fluorescent light use and a "must have" for every gesneriad grower using artificial light is an appliance timer. This allows for the standard application of a set day length while removing the grower from the daily necessity of manually turning lights off and on at prescribed times. Timers can be purchased at any store where fluorescent lights and fixtures are sold.

Cool white tubes are the cheapest and most commonly used fluorescent lights.

There are no rules but only guidelines for achieving the optimum or right distance from the lights to the plant material. Humidity, temperature, fertilizer, growing medium and watering schedule & method all affect the way plants use light. As a general rule, the maximum range fluorescent tubes should be above the tops of plant material is no more than 15 to 17 inches. Remember this maxim: the closer the lights or tubes are to the tops of the plants, the stronger the light while the higher the lights and the further away the tubes are from the tops of plants, the weaker the light. To effect adjustments in height and light exposure, "high light" gesneriads, i.e., those requiring more light, should be raised up on pots or other supports. Under this type of situation, the tops

Fluorescent lights should be replaced when they've used half of their expected lifespan, i.e., 6,000 hours

of some gesneriads will, in fact, be no more than 2 to 3 inches from the tubes while their lower foliage can be used to provide shading for "low light" gesneriads.

Fluorescent lights have a typical lifespan of approximately 12,000 hours. To maintain a gesneriad collection growing well, fluorescent lights should be replaced when they've used half of their expected lifespan, i.e., 6,000 hours. For example, if tubes are run for twelve hours a day, they will require replacing after slightly more than one year. As most growers vary the length of time they leave their lights on, it is easiest to plan for a "staggered" replacement of fluorescent tubes on an annual basis, e.g., half in June and half in December. Under no circumstances, should all the tubes in one fixture be replaced at one time. This can lead to leaf, tip and crown scorching.

Another more visual reminder that it's time to change tubes is when "smoke rings" develop at the tube ends.

LIGHT STANDS

There are several types of commercially manufactured light carts and stands suitable for growing gesneriads. Sturdily constructed, many are built with wheels for easy movement from one location to another. These carts and stands are attractive and fit well into any home decor. They also provide a "way out" for the gesneriad grower who is not particularly handy with either a hammer or do-it-yourself projects. The main disadvantage to these manufactured carts is their prohibitive cost.

In addition to commercial light carts, shelving units, with a little work, can be adapted with lights and trays to meet the growing needs of gesneriads. Shelving units carried by firms such IKEA and Home Depot are ideal for this purpose.

With a little work, metal and wood shelving units can be adapted with lights and trays to meet the needs of gesneriads.

LIGHT CHECKLIST

- "Low light" gesneriads, if grown under natural light, require a northern to north-eastern exposure during the months of May to September and a shaded eastern or western exposure for the remainder of the year. If artificial light is used, they should be grown under 2 tube fixtures which are run approximately 12 hours a day.
- "Medium light" gesneriads, when grown under natural light, require a shaded eastern or western exposure throughout the year. If "medium light" gesneriads are grown under fluorescent light, either 2 or 4 tube fixtures can be used, both of which should run for approximately 12 to 14 hours a day.
- "High light" gesneriads grown under natural light require a southwestern or southeastern exposure. Under fluorescent lights, they should be grown under 4 tube fixtures which should run no more than 16 hours a day.

Gesneriads exhibit specific characteristics when they are consistently receiving too much or too little light. For example,

- If a light source is too weak, gesneriads will exhibit some of the following characteristics: diminished or total lack of bloom; less than normal-size or small dark green leaves; longer than usual or etoliated stalks and stems, i.e., stretching towards the light source.
- If a light source is too strong, gesneriads will exhibit some of the following characteristics: knotted or brittle crowns and growing tips; yellow or bleached leaves or leaf margins; unnatural curling of leaves or stems down around plant's container; severe changes in leaf or growth habits.

LIGHT EQUIPMENT SOURCES

Lee Valley Tools <http://www.leevalley.com>
1180 SE Marine Drive (By Knight Street Bridge)
Vancouver, BC
Telephone: 604-261-2262

Dominion Seed House <http://www.dominion-seed-house.com>
PO Box 2500
Georgetown, Ont, L7G 5L6
Telephone: 1-905-873-3037

Indoor Gardening Supplies <http://www.indoorgardensupplies.com>
PO Box 527
Dexter, Michigan, USA 48130
Telephone: 1-800-823-5740

There are several types of manufactured light stands available which are suitable for growing gesneriads.

REFERENCES

Gesneriads: The Miracle Houseplants, Viriginie and George Elbert

African Violets: Gifts from Nature, Melvin J. Robey

How To Grow African Violets, Sunset Books, Lane Magazine & Book Company

Growing To Show, Pauline Bartholomew

Success With House Plants, Reader's Digest

Growing Houseplants Under Lights, Charles M. Fitch

Making Things Grow, Thalassa Cruso

The Facts of Light, National Edition, Ortho Books

Fluorescent Light Gardening, Elaine Cherry

The Indoor Light Gardening Book, George Elbert

Gesneria and koellikeria are considered "low light" gesneriads.