

The Beginners Guide to Indoor Light Gardening



Light N'Grow™ Indoor Gardening Centre

We are happy to provide the following material to help in starting your indoor light garden. The information provided is collected from various sources – we do not profess to be experts, just simple users. This booklet is a guide and your own experience, research and experimenting will be the final test of how well your garden grows!

The Beginners Guide to Indoor Light Gardening

As a new gardener or as an experienced gardener you will learn new skills as a year 'round gardener. This is gardening you can enjoy indoors with very satisfying results!

We would like to treat this guide as a living document. We invite your input. If you have comments or additional material that would be useful to other users we will gladly edit this document to improve the usefulness and accuracy of the content.

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Light Talk

Gardening indoors under fluorescent light requires very little gardening 'know-how' or special skills. The rewards from this hobby can be quite high; whether you grow annuals, perennials or fresh garden vegetables, culinary herbs, bonsai or even orchids; you may be keeping your home filled with lush foliage and bright flowering plants or starting up a small business selling your plants to local florists, plant stores or nurseries.

When you're ready to follow some good indoor light gardeners' guidelines, you can plug in and get growing!

Light Facts

Gardening indoors with artificial light is a relatively new science that made very notable progress with the introduction of the fluorescent lamp 70 to 80 years ago.

The fluorescent lamp was produced with specific commercial and industrial applications in mind; however the lamp proved to be particularly well suited to satisfying the specific interests of indoor gardening.

Cool burning fluorescent lamps produce bright light intensities for very long periods of time and are quite 'cool' relative to the amount of light they offer (compared to the high heat generated by incandescent lamps).

An incandescent lamp produces light by passing electrical current through a tungsten filament to the point of 'white heat'. Ninety percent of the energy generated this way isn't light at all; it's just heat.

Only ten percent of the energy generated by an incandescent lamp is actually useful light.

The fluorescent lamp on the other hand, produces light by passing ultraviolet radiation through a chemical vapour resulting in energy production that is the reverse of the incandescent lamps, (a fluorescent lamp generates ninety percent light energy and just ten percent heat energy!)

Light!

Light is essential for plant growth.

In plants, light supports photosynthesis, the life process of food production in plants.

With sufficient light any plant will prosper. Without light plant growth slows or stops altogether; leaves wilt and drop, the plant weakens and dies.

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With a Light Garden light intensity levels are very high, are perfectly consistent day after day and the length of day is readily controlled.

Light intensity is measured in terms of 'foot candles'.

The intensity of light you provide for your plants each day depends upon the number of lamps you have in each light fixture, the types of lamps you are using, the distance the lamps are from your plants, the age of the lamps and the lamp cleanliness.

At the central point of each light fixture, just six inches below a pair of 40 watt (4' long) fluorescent lamps, the foot candle (fc) output is 700-800, plenty to grow most everything you might be interested in, indoors.

Most plants require considerably less light, many as little as 200-250 fc.

Quality of Light

The intensity of light available to our plants from the sun is much greater than we can provide artificially indoors. This notable difference in the quantity of light available is more than adequately made up for in the most notable difference in the quality of light available!

The quality of light is revealed when a beam of light is shone through a prism to create a rainbow of colour. These colours, from red to violet, orange, yellow, green, blue and indigo, complete the light spectrum we see and call 'white light' or visible light.

What a prism does not show us are the invisible rays of infrared and ultraviolet light that are a part of the sun's natural light. These combine together to make up the full spectrum of natural light we get from the sun.

In the world of plants, the orange, yellow and green light is essentially unused.

Plants thrive on the blue, red and far red sections of the light spectrum. As well, near UV sections can be beneficial.

This is key to why we are able to grow so well indoors.

Fluorescent lamps, even the most standard, are rich in blue light which is the most important section of the natural light spectrum in any plants early stages of development. The more specialized 'plant lights' are richer in reds, far reds and in some cases beneficial U.V. These complete the light spectrum you need to grow successfully indoors; from seed to full maturity!

You can enjoy greater success with many more indoor plants than you could possibly outdoors.

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Choice of Light

Which light to use? Choosing is anything but simple.

There are Cool Whites, Warm Whites, Daylights and Deluxe Warm Whites; Mainlighters and Wide Spectrum, Plant Lights, Vita-Lights, Gro-Lux® and Agro-Lites; Gro & Sho, Gro-Lume, Dura-Lites, etc.

In general, for seeding, seedlings, young plants and foliage plants you can have reasonable success with inexpensive Cool White (3500k) and Warm White (4100k) lamps available at most hardware and house-ware stores.

You could use one Cool White and one Warm White in each fixture. This combination provides a good rich blend of blue light from the Cool White bulb, with a boost of blue plus a hint of red and far red light from the Warm White bulb. This is an excellent colour spectrum for starting seeds and young plants and for maintaining lush foliage.

For later stages of maturity and for flowering plants, additional red and far red light will be beneficial.

To achieve this colour spectrum, a mix of Cool White (3500k) **or** Warm White (4100k) lamps, with **one** “plant light” (full or wide spectrum) in each fixture will do very well.

The ‘plant lights’ available today are excellent light sources, however they are somewhat expensive.

As few plants demand the fullest spectrums of light offered by ‘plant lights’ you can combine them with the lesser expensive lamps for good performance and good economy.

Choosing lamps for your Indoor Light Garden is not always easy. There really is no one single correct answer. Experiment with various combinations and choose the one that best suits your situation.

How Much Light?

As important to your success indoors as the quantity of light and the quality of light is the duration of light you need to offer your plants.

Here we refer to the length of day you create in your Light Garden. The amount of time each day that you have the lights turned on.

For each plant this specific requirement is known as the ‘photoperiod’, the amount of time (hours) each plant prefers to be exposed to light each day.

Plants also need to rest each and every day.

Some are short-day plants, requiring very few hours of light each day. Some are long-day plants. Others prefer an intermediate day length and others still are day-neutral.

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Short-day plants require only 10 to 12 hours of light each day (with a corresponding 12 to 14 hours of dark). This promotes vigorous buds and blooms. Plants in this category include those that normally blossom in the Fall or Winter, such as mums and rieger begonias.

Long-day plants need 14 to 18 hours of light each day and only 6 to 10 hours of dark. These include the Spring and Summer flowering annuals.

Intermediate-day plants flower within a very narrow and specific range of light and dark requirements, usually about 12 hours each. Poinsettias are a very good example of this type. Note that as little as ten minutes of light interruption during just one period of dark can upset the whole blooming process and end the plants schedule for flower or colour for that year. (Very few plants fall into this demanding category).

Plants in the day-neutral category have a relative indifference to the number of hours of light they receive each day. A consistency in photoperiod each day does (within this group, as within all groups) make a great difference.

The day-neutral group, which includes the venerable African Violet will perform very well in day lengths of 10 to as much as 20 hours of light daily.

Try your own tomatoes indoors too! This popular home grown vegetable does very well indoors and is another easy-to-grow day-neutral variety.

To save you the labour of turning your lights on each morning and off each evening consider adding an automatic timer to your Light Garden.

Your plants will enjoy their 'sunrise' like clockwork. Set the timer to the number of hours of light you want each day and there is no need to worry about consistent timing.

Starting Plants from Seed

You may have intention of starting plants from seed for later outdoor transplantation; annuals, vegetables and perennials, geraniums, for example.

Starting from seed is easy. Your Light Garden offers the right conditions!

Seeds can be -
light-responsive: use light to germinate
light-sensitive: will not germinate in the presence of light
or
light-indifferent: couldn't care less about light.

To find out which seed is, take a look at your seed packets to determine the conditions.

Light responsive seeds are usually scattered, uncovered, over the surface of the growing medium.

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Light sensitive seeds, those that need total darkness for germination, can be set into the medium and covered in an opaque plastic garbage bag, perhaps.

Of course, light indifferent seeds require no special attention.

Air and soil temperatures are also important in seed germination.

Some like it cool, some like it warm, but most will tolerate a range of temperatures.

For those that prefer cool starting temperatures, place them on the bottom shelf of your Light Garden with the light (if required) placed about 12 inches above the growing medium.

For warmer conditions, set your seed starting bed on top of a (well fastened) light fixture or on a heating pad or on top of your refrigerator.

Your seeding mixture should never be allowed to dry out.

After seeding and watering, help the growing medium to retain moisture by covering the container with a clear plastic film taped to the ends and sides of the container.

As moisture will cloud the underside of the film, one end should be lifted daily to check for seedlings.

Once you have about 25% of the seeds started, remove the film and lower the light to only inches above soil level, to avoid rapid, spindly growth.

And, be careful not to be fooled by the germination times offered on the seed packets. These times relate to outdoor and greenhouse growing. Your results will come on much more quickly in your Light Garden.

Seeders' Digest

When buying seeds look at the instructions on the packets, especially varieties you are not familiar with.

Some information is so general; it is of little use to you in your Light Garden. Others will give you information, tested percentages of germination, light and temperature requirements, germinating times, transplanting and other gardening tips.

Some of the very best comes from your Seed and Garden mail order houses.

If you were to call or write your favorite Catalogue House and explain your specific interest in Indoor Light Gardening, they should be able to suggest a selection of seeds best suited for your needs.

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Propagation

If you have used the Light Garden to start your plants from seeds, another adventure might be starting new plants from slips and cuttings from older established plants.

Propagation is a way to expand your plant collection and your Light Garden gives you the perfect environment to do so.

The Light Garden is full of bright, consistent light along with easily controlled temperature and humidity conditions, and there is virtually no concern for pest or disease.

If you are taking cuttings from a plant grown under natural light as in a window or out of doors, cuttings are best taken in the Spring when the plant is putting on new growth.

In your Light Garden cuttings can be taken any time of year because there will always be new growth!

The easiest way to propagate a new plant is from a stem cutting.

Take a look at your house plant collection. If you have a branching plant such as jade, hibiscus, ivy or a geranium you can take a stem cutting.

Select any shoot, three to six inches long, and make a clean cut just below the bottom leaf. Remove all the leaves on the cutting except for two or three at the top.

These are needed to process the light through photosynthesis, to develop a healthy root system.

Fill any container that has holes for drainage with a medium grade vermiculite or quality soilless mix.

Add about one cup of tepid water for every five cups of rooting medium and let drain.

Touch those points on the cutting where the bottom leaves have been removed with a rooting hormone gel (this is available from your local garden centre or seed catalogue supplier).

This provides a thin protective coating that contains a fungicide that prevents root rot (the number one problem with plant cuttings).

Insert about half the cutting in the moist rooting medium and place back under your lights.

After a week or so, check the cuttings' progress by carefully removing one cutting from the rooting medium. You should find some fine root hairs forming.

Replace the cutting and two or three weeks later, check again by gently tugging on the cutting. Resistance to your tugging tells you that the cutting is setting roots and that in another two or three weeks, they should be ready for individual potting.

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Food & Fertilizer

Plants require a great variety of elements and nutrients for healthy growth.

These can be broken down into two principal categories:

- the major or “macro” elements
- and the
- minor or “micro” elements.

One of the top major elements is light.

Others are Carbon Dioxide, Oxygen and Hydrogen, which the plant draws from the air and water. Included are Nitrogen (for leaf growth), Phosphorous (for root growth and flowering) and Potash (stem strength and disease resistance).

These are the major elements of plant fertilizers and are represented as a percentage of content in the familiar descriptions of general purpose 20-20-20 or the popular “bloom booster” 10-52-10.

The balance of materials in these fertilizers is other required elements, some major foods and some minor foods, but all important.

You will enjoy success and ease of use indoors with water soluble crystal fertilizers. However many others will work well for you as well.

Mix and use fertilizers carefully and according to directions.

Water

Water is the most prevalent element in all plant cells and provides vital transportation for the ever important nutrients taken up by the plants root system.

If the water you are using for your plants is heavily chlorinated, it should be left to stand for a day or two in a large pail or other container before using. If you have a water softening system, bypass it for best results.

Water should also be room temperature before using – cold water slows growth and development.

The most critical stage for watering is the seedling stage. Your growing medium should never be allowed to dry out and gentle watering is a must to protect from washing out or flattening your seedlings.

Bottom water or use a water “shaker” with small holes for gentle watering.

If you are using a soilless mix, overwatering is unlikely because of its excellent drainage characteristics, but expect to water a more frequently.

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Keep a close eye on all your plants indoors. You will become familiar with the signs for overwatering or need for water – getting it right will provide accelerated success.

Insects & Disease

Insects and disease are almost unknown to a seasoned Indoor Light Gardener.

You could see the odd mite or white fly on a cutting from outdoors if you are neglecting to spray or isolate, however with a very little bit of care you should be able to garden indoors under lights virtually pest and disease free.

If you are using soils you should sterilize or water with a fungicide solution.

Soil is the prime source for both insect and disease organisms indoors. Even commercial “sterilized” potting soils cannot always be trusted so be careful.

With any insect or disease problem do consult your local garden centre or horticultural society for advice and follow all directions for use when using pesticides or fungicides indoors (and out).

Inside to Outside

It is probable you will be transplanting some of your Indoor Light Garden plants from indoors to outdoors.

Plants grown indoors under lights have very soft tissues and must be hardened off before planting outside.

For a week or more before moving outdoors, place your selected plants in a sunny window several hours each day.

A week before actually transplanting outdoors place your plants on a balcony or on a garage floor for a few hours each day for a gradual introduction to cooler temperatures, direct sun and wind.

After increasing the time of exposure each day and after any danger of frost is past move your plants outdoors and prepare them for transplanting.

Be prepared to step up your watering in this last week and beyond as your growing medium will demand more water when exposed to the drying effects of sun and wind.

Once your plants are in your garden outdoors, enjoy them knowing they are growing vigorously because of your care, attention and success with your indoor Garden Lighting Centre!