

G**uide for Growing Under Lights**

Growing your own seedlings for transplanting to your garden can be fun and rewarding. However, starting seeds in windowsills does not yield healthy plants as light levels are too low and plants become thin as they stretch towards the light. The best method for starting seeds indoors is to grow them with the help of florescent lights- using grow light units. Below are some guidelines and helpful hints for having success with starting seeds indoors under lights.

**Equipment and Materials**

* Grow Light Unit
* Timer
* 6-packs, peat pellets or other growing containers
* Pro-mix or other soil-less growing mix
* Seeds
* Plastic bags or plastic flat covers
* Spray bottle with mist setting
* Shallow tub for watering
* Short plant marking stakes and felt-tip marker to label cell packs

**Planning**

* Start seeds indoors under lights approximately 5-9 weeks before you want to transplant the seedlings to your outdoor garden. Germination and growth rates vary by plant type; investigate the needs of the seeds you are planting to determine the best time for starting seeds indoors (see KCCG’s Growing Under Lights Planting Schedule).
* The florescent lights will produce enough light for the plants to grow, so you do not need to place your grow lab by the window. In fact, you want to make sure that the grow lab is situated away from any drafty windows or heating vents/radiators as extreme fluctuation in temperatures may adversely affect plant growth.
* Plants grow best directly under the lights. The number of cell packs you can use in your grow light unit depends on how many lights you have. Typically, you can only fit one row of 6-packs under a fixture with two florescent light bulbs. If you want to grow a row of standard flats, you will need a bank of 3-4 fixtures.

**Planting your seeds**

* Put your pro-mix in a large container or tub and mix with water until pro-mix is moist.
* Loosely fill your 6-packs with moistened pro-mix, leaving ½ inch space at the top of each cell.
* Set 2-3 seeds on top of the pro-mix near the center of each cell.
* Sprinkle dry pro-mix on top of seeds so that the seeds are lightly covered.
* Using a spray bottle, mist the 6-packs until top ½ inch is moistened (soil will turn darker).
* Cover 6-packs with plastic bag or covers.

**Germinating Seeds**

* You are now waiting for your seeds to germinate. Place plastic covered 6-packs in the grow light unit,
* Adjust lights so that they are 2-3 inches above the top of the 6-packs and turn on lights.
* Check the 6-packs every day to make sure that the soil stays moist. If the soil has dried out, pull remove the plastic from the 6-pack, mist with water and then replace the plastic covering.
* Check the 6-packs every day to see if your seeds have sprouted. Once you see the first green shoot emerging from the soil, remove the plastic from the 6-packs and place them under the lights. You will now want to adjust the lights so that they are closer to the seedling.

**Lighting**

* Although the light given off in the grow labs may seem bright to you, it is still much weaker than the light given off by the sun.
* When seedlings do not get enough light, they stretch towards the light and become long and thin. These are not healthy plants.
* In order to prevent stretching, the lights need to be kept at 1 inch above the tops of the plants at all times. Check the grow lab each day and make adjustments as needed.
* The center of your florescent lights is much more intense than the 12 inches on each end. Rotate your plants to keep them growing evenly.
* It is recommended that you allow your plants 16 hours with the lights on, and 8 hours with the lights off. You can use a simple light timer to turn on and off the lights so that lighting is consistent.
* You do not need to purchase special grow lights. Standard fluorescents work well.

**Thinning**

* More than one seed may germinate in a cell pack cell. If more than one seed sprouts in a cell, remove the extra seedlings.
* If possible, leave the strongest looking plant that is growing closest to the center of the cell.
* Thin plants before they reach 1 inch in height.
* Try not to disturb the plant that you want to keep. Use tweezers to remove the extra seedlings.
* Thin when the soil is moist.

**Watering**

* Use room-temperature water to water your plants.
* Once the plastic wrap is removed from your plants and they are under the lights, they will dry out faster and will need to be watered more often.
* Misting with the spray bottle will not moisten the soil enough for young seedlings.
* Young seedlings are fragile and heavy watering can knock them down. It is best to water them with a fine spray. However, if you do not have that available, you can use the following method:
	+ Water 6 packs by placing in a shallow tub filled with ½- 1 inch of water.
	+ Allow the water to wick up through the pro-mix until it reaches the top of the cells (you will see the soil turn a darker color and it will feel moist)
	+ Remove the 6-pack from the water and allow the excess water to drain out of the bottom (you can set it on a block or overturned flat to let the water drip out).
	+ Return 6-packs to grow lab.
* Once plants are established (3-4 inches tall) you may water from the top with a watering can.

**Fertilizing**

* Plants need nutrients to grow: too much and they will be too tall, too little and they will be stunted.
* Start fertilizing as soon as plants sprout.
* Use liquid fertilizer at half-strength
* Fertilize once a week.
* If you are using a shallow tub to water your plants, you can put the fertilizer water in the tub and allow it to soak up as you would the water.

**Transitioning to the Outdoor Garden**

* Planting your plants directly from your grow lab into your garden can shock your plant and keep it from growing to its full potential because:
	+ Light levels outside are 10-20x stronger than the light level in your grow light unit which can cause the plants to sunburn when they are planted outside.
	+ Cold temperatures and strong wind can shock the plants.
* A week before you want to transplant the seedlings to your outdoor garden, “harden off” (acclimate) plants by moving them outside for short periods of time during the day, increasing the amount of time in the sun each day.
	+ Here is a sample schedule for schools. If you have access to your seedlings over the weekend, you can put the plants outside on Saturday and Sunday and “harden off” your plants in 7 days instead of 9.

|  |  |  |
| --- | --- | --- |
| **Day** | **Hours Inside Under Lights** | **Hours Outside** |
| Thursday | 15 | 1 |
| Friday | 14 | 2 |
| Saturday | 16 | 3 |
| Sunday | 16 | 4 |
| Monday | 14 | 5 |
| Tuesday | 13 | 6 |
| Wednesday | 11.5 | 7 |
| Thursday | 10 | 8 |
| Friday |  | plant outside |

**Additional Tips**

* Peat pellets can be used instead of 6-packs for growing plants that vine. Note that you are not growing these seeds for as long under the lights, but are rather just using the lights to help germinate the seeds and give you a 1-2 week jump on their growing season.
* Different plants have different germination and growth rates. If you are growing a number of different plants under one light, you may need to adjust your 6-packs or flats so that the tops of the plants continue to be 1inch away from the lights. To do this, you can set the light so that it is 1 inch from the top of the tallest plants and the use blocks to rise up the other 6-packs or flats.
* Stretching of plants due to lack of light is the most frequent issue with starting seeds indoors. If your plants get stretched out, you will need to start over. A thin, stretched out plant cannot be made into a healthy plant.

Growing Under Lights Planting Schedule

|  |  |  |
| --- | --- | --- |
| **Plant** | **Date for Planting in Garden** | **Number of Weeks Until Transplant** |
| **SPRING** |  |  |
| Arugula | 3/15-4/25 | 5-7 |
| Broccoli | 3/20-4/10 | 5-7 |
| Cabbage | 3/20-4/20 | 5-7 |
| Collards | 3/15-4/10 | 5-7 |
| Kale | 3/20-4/5 | 5-7 |
| Lettuce | 3/15-5/10 | 4-6 |
| Spinach | 3/20-4/20 | 4-6 |
| Swiss Chard | 4/1-5/30 | 4-6 |
| Tatsoi | 3/15-5/1 | 4-6 |
| Cilantro | 3/20-4/15 | 4-6 |
| \*Snap Pea | 3/15-4/10 | 1-2 |
| **SUMMER** |  |  |
| Eggplant | 5/10-5/25 | 6-8 |
| Pepper | 5/1-5/30 | 7-9 |
| Tomato | 5/1-5/20 | 5-7 |
| French Sorrel | 5/1-5/20 | 6-8 |
| Basil | 4/20-5/20 | 6-8 |
| \*\*Chives | 3/15-5/1 | 6-8 |
| Marigold | 4/15-5/15 | 7-9 |
| Zinnia | 4/15-5/15 | 4-6 |
| Cotton | 5/1-5/20 | 4-6 |
| \*Purple Hyacinth Bean | 5/1-5/20 | 1-2 |
| \*Cucumber | 5/5-5/30 | 1-2 |
| \*Pumpkin | 5/15-5/25 | 1-2 |
| \*Squash | 4/25-5/30 | 1-2 |
| \*Gourds | 4/25-5/30 | 1-2 |
| **FALL** |  |  |
| Arugula | 8/1-8/20 | 5-7 |
| Broccoli | 7/25-8/5 | 5-7 |
| Cabbage | 7/20-8/5 | 5-7 |
| Collards | 7/25-8/20 | 5-7 |
| Kale | 7/25-8/20 | 5-7 |
| Lettuce | 8/1-8/20 | 4-6 |
| Spinach | 8/1-8/20 | 4-6 |
| Swiss Chard | 7/25-8/20 | 4-6 |
| Tatsoi | 8/1-8/30 | 4-6 |
| Cilantro | 8/15-9/15 | 4-6 |

\*plant in peat pellets

\*\*plant 7-15 seeds and do not thin

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