

Seed Starting Workshop

March 21, 2019

Why grow your own seedlings?

- To save money
- To get a jump on the season
- To experience your plants from seed to harvest
- Because it's fun!

Direct seeding vs. transplanting – Many seeds can be directly planted in the ground and grow just fine. However, temperatures indoors tend to be warmer than outdoors during spring planting time (especially in Michigan!) By the time outdoor temperatures are warm enough for seeding, your seedlings grown indoors will already be several weeks old, giving you a jumpstart on the season and allowing you to reap the fruits of your labor earlier!



It makes more sense to seed certain plants directly in the ground. These include peas, beans, corn, radishes, turnips, beets, carrots, rutabaga, dill, cilantro, among a few others. Things that do best when transplanted include tomatoes, peppers, eggplants, broccoli, cabbage, basil, plus a few more. Plants that can be either direct seeded or transplanted and have similar results are cucumbers, beans, summer squash/zucchini, pumpkins, and winter squash.

What you'll need to get started:

- Containers for planting
- Media (potting soil)
- A sunny windowsill and/or a light
- Seeds
- Water

- I. Containers It's fun to get creative with containers for growing your seedlings. From plastic cell-packs to egg cartons, there are many containers you can use to get your plants started. Just remember that it's important for your containers to have drainage holes – too much water can be bad for little plants!



- a. **Cell packs** – These are made of plastic and can be purchased from your local garden supply store. If you take good care of them they can be reused from year to year.

- b. **Egg cartons** – Egg cartons are a great way to start your seedlings – cardboard cartons tend to be the best because they have built in drainage, allowing just enough water to wick and evaporate through the container walls. They can also be planted directly in your garden and they're free!

(Styrofoam and plastic egg cartons can be used as well but you'll have to poke drainage holes in the bottom and you can't plant them directly into your garden.)



II. Media/Potting Soil

a. Media is the potting soil in which seeds are planted. For the home gardener, bags of seed starter can be purchased from your local garden store. Note that you don't want to use just any potting soil – you should plan to get a mix that is designed for growing vegetables.

- This mix usually consists of one or more types of sphagnum peat moss (for structure), perlite or vermiculite (a mined substance used for creating air space in the soil), compost or worm castings (for nutrients), horticultural lime to balance pH and sometimes additional ingredients for fertility. Blood meal is a commonly added nutrient – it is high in nitrogen, a nutrient that is very important to plant health.



III. Temperature Most seedlings germinate best between 70 and 80 degrees F.



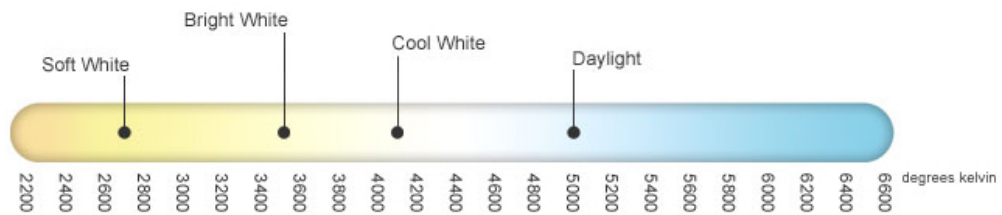
- a. If you're growing in your home near a window, supplemental lighting will raise the temperature for you a bit. If you keep your house pretty cold during the spring or if you're growing in a colder space like the basement, you may want to invest in a heating pad to get your seedlings started.

After germination, most varieties should grow fine between 60 and 70 degrees. (Tomatoes and other summer fruits like it a bit warmer but will do great at 60-70°F).

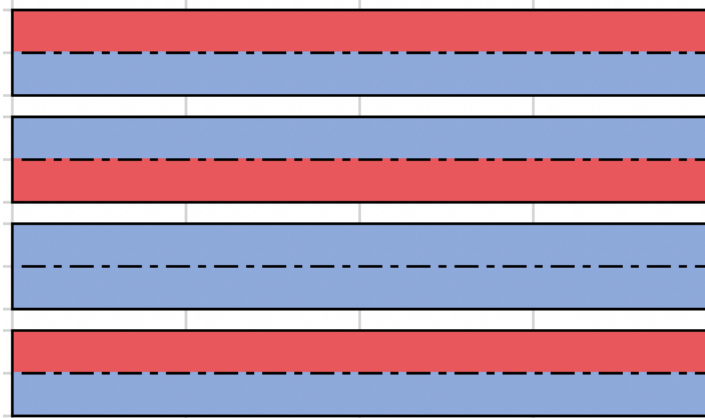
IV. Light Nothing beats full sun when it comes to growing plants. However, there often isn't enough natural light available on a windowsill to grow good quality transplants. I highly recommend using supplemental lighting if your plants are not going to be in direct light for most of the day (we're talking 10+ hours). If you are blessed with a south-facing sunroom with little to no shade, the rest of us are jealous. You should be fine. Everybody else? Consider a lighting system:

- a. **Shoplights – Fluorescents:** You can easily build a light shelf with a shoplights and fluorescent bulbs which can often be purchased used. Livonia lighting has good ones that can be found your local hardware store or on Craigslist. The most common bulb type is T8 They come in T5, T8, and T12 – the smaller the number, the smaller and more efficient the bulb. You’ll learn quickly that you have many choices when it comes to selecting light type. You’ll want to pay attention to the color temperature, measured in degrees of Kelvin (the number next to the “K” on the bulb). *Daylight bulbs* with higher K rating are good for almost all vegetative plants like brassicas (kale, cabbage, broccoli, etc.) because they have more blue light. *Soft white bulbs* tend to have more reds and are better for plants that flower like your summer fruits (tomatoes, peppers, etc.)

4’ Fixture + 2 bulbs = about \$30



This is a good time to ask yourself, “What would Mother Nature do?” The sun is a giant full spectrum ball of fire. It gives off all of the types of light that plants need. Because transplants are in the vegetative state (regardless of whether they will fruit or not), more blue light is better. All plants do well with a full spectrum of light. I would recommend having one soft white bulb for every two daylight bulbs in a pattern like this:



- b. **Shoplights – LEDs:** Fluorescent lights are getting harder to find at hardware store and LEDs are now much more affordable than they were even a couple of years ago. Consider investing in LEDs – the bulbs last 5 times longer and are “integrated” into the fixture (fluorescent fixtures and bulbs usually have to be purchased separately). Most shop light LEDs available in hardware stores are 4000K which is suitable, although not necessarily ideal, for seedlings. There is a bit more versatility with fluorescents in terms of color temperatures. **4’ Fixture with integrated bulbs = \$35**

- c. You can either hang your shoplight from chains or use some sort of system to prop the light fixture up. You're going to want to keep the lights as close to the plants as possible without touching them for best results. Make sure that your system allows you to adjust the height of the fixture as your plants grow! (Don't let the plants touch the light or they may burn!)



- The more light the better – consider buying multiple fixtures and placing them next to each other (I have 4 fixtures per shelf, 8 bulbs total). This can get a little pricey but will make a significant difference in the quality of your plants.
- People typically leave these types of lights on for about 12-16 hours per day. Your plants will do fine with slightly less light if you're not comfortable leaving the lights on for that long. You can adjust your "day length" to speed up or slow down growth. It is not necessary to leave lights on overnight. Turning them on when you wake in the morning and off before you head to bed should be sufficient. You can also get a timer to make your life a bit easier.

- d. **High tech option:** Special LEDs, high-pressure sodium or metal halide lights. These are typically used by commercial growers and aren't necessarily recommended for small-scale gardeners unless you have a very large garden as they can be very pricey. Your local grow stores can help you get what you need if you're interested. (~\$300 per system, possibly worth it if you're growing a lot and have a lot of space.)

But what about "Growlights??" These are generally doing the same thing that your fluorescent/LED shop lights are capable of but at about twice the price! Companies tend to be sly and not list the Kelvin ratings on their bulbs so it's tough to know exactly what kind of light they're using. It's safe to assume that these are closer to "full-spectrum" bulbs with a good amount of blue light – unless you've got a hefty budget or are getting them for free, purchasing grow lights is unnecessary, in my opinion.

V. Seeds

- a. Some people like to save seeds from their plants from year to year. The possibility of doing this depends on the plant and whether it is a hybrid or an open pollinated variety. I won't go into detail about that here but there are some good resources online. Here's a good place to start:
<http://gardening.about.com/od/gardenmaintenance/a/SeedSaving.htm>;
<https://www.southernexposure.com/why-heirloom-seeds-ezp-20.html>

- b. *Sourcing* - Most people buy seeds either online or at their local garden supply center. Seed packets often have special instructions for different seed needs – consult the back of the packet to learn more about what your seeds need to grow. Some great options for ordering online include Baker Creek Heirloom Seeds, Johnny’s Selected Seeds, Seed Savers Exchange, Sustainable Seed Company, and Southern Exposure. Ann Arbor Seed Company and Nature & Nurture are great Michigan-based companies.
- c. *Planting* – Seeds typically like to be planted at about twice the depth of their diameter. (e.g., If the seed is $\frac{1}{4}$ of an inch across then you’ll want to plant it about $\frac{1}{2}$ of an inch deep in the soil.) Small seeds like broccoli and cabbage should be planted on the surface and covered lightly with soil.



VI. Watering – The most important thing you will do for your seedlings is to make sure that they are appropriately watered. Not enough water can be detrimental but having too much water can be just as bad.

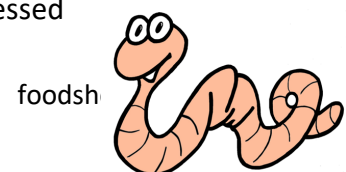
- a. *Water lightly in the seed stage* – Seeds that are in the process of germinating like to have constant moisture. Think of the soil as a sponge surrounding your seeds – if the sponge that they live on dries out, they will dry out.

Because water is required for seed germination you want to make sure this sponge stays nice and moist. However, you don’t want to dump water onto your seeds – too much water applied all at once can wash your seeds out or can simply keep them from growing/cause them to rot.

If you are able to water your seeds multiple times throughout the day, you can use a spray bottle for watering. If you’re gone during the day you should give them more water in the morning to get them through till you can attend to them in the evening. Poking small holes in the top of a Gatorade bottle is one creative way to make your own watering can for very young seedlings.

- b. *Watering during leaf growth stages* – As your plants grow larger they’ll need more water. Once plants have established some roots and can hold their own in their cell, you can water them with a watering can. If you don’t have a can that’s the right size for this you can make your own by poking holes in the top of a laundry detergent bottle or a large salsa container. Remember, plants use more water during the daytime while they’re growing under light – no need to drench your plants at night.

VII. Fertilizer – You may want to give your plants a little boost once they’re a few weeks old to prevent them from becoming nutrient-stressed



and turning yellow. Worm castings (aka. worm poop) and compost make great fertilizers for plants, although your homemade compost is likely not stable enough for delicate transplants. Fish emulsion and seaweed solutions can also be used for fertility but they are a bit more expensive and can be pretty stinky!

VIII. Timing

a. Most people wait until May or June to begin “transplanting out” their seedlings. Plants that are more cold tolerant can go out before the risk of frost has passed in April and May (see below). Others aren’t quite as hardy and need to wait until June before they can be planted outside.

- i. *Cold tolerant plants*: onions, leeks, kale, collards, Swiss chard, spinach, lettuce, pac choi, cabbage, broccoli
- ii. *Warm season plants*: tomatoes, peppers, eggplant, basil, cucumbers, melons, squash, zucchini, pumpkins



You’ll want to take this into consideration when planning your garden. Make sure to give your plants several weeks to grow inside before planting them out. Roots should be well formed and should hold the soil together. Make sure not to let your plants become too “root-bound” in their cells; this can stress the plant out and cause the roots to have difficulty growing out once planted in the ground. A good rule is if the roots hold the soil together in the form of the cell but you can break the roots apart and away from the soil easily, then you’re in good shape; if they don’t want to separate with ease and are tightly bound then they need to be planted asap! Feel free to check on the roots of your plant from time to time by lifting the cell out with a butter knife.

Other things to consider and remember...

- Don’t forget to label your plants. Sometimes it can be hard to identify exactly which plants are which when they’re small.
- Small plants don’t like major fluctuations in temperature. Try to ease them into colder temperatures by moving them onto a porch during the day and back in at night about a week before planting. This is called “hardening off.”
- Some plants take a lot longer than others to grow – don’t forget to consult your seed packets before you begin.
- Plants want to grow – in fact, it’s their mission in life! Be adventurous and don’t be afraid to experiment... have fun with your plants!

Troubleshooting:

My seeds are spindly and stretched. What's wrong?

This usually means that your seedlings are not getting enough light. Try giving them supplemental light, up to 18 hours a day, and make sure that your lights are as close to the plant as possible. Sometimes warmer temperatures can also encourage legginess. Try lowering the temperature of the room if your plants seem to have enough light but are still stretching.

My seedlings are turning strange colors. Tomato leaves are purple and Kale leaves are yellow. What's going on?

This means that your plants are not getting enough of the right nutrients. Tomatoes and other solanaceous crops need a good amount of phosphorous to grow properly. Phosphorous is the "P" is the middle number found on most fertilizers (e.g., 5-4-3). Make sure the P value of your fertilizer is at least a three and add some fertility to those plants. Leafy green plants turn yellow if they don't get enough nitrogen (or they're getting too much water which means nutrients are being leached out). This is the first number in the NPK value.

I have little gnats flying around my plants. Is this a problem? What do I do?

These are called fungus gnats. It's possible that the medium you're going in is too wet. You'll want to break up any green algae you see on the top of the seedling soil surface and back off a bit on the water. These gnats shouldn't do much damage, but you don't want them to continue to proliferate. Mold growing on the surface of soil can also be an indicator that things are too wet.

My plants are rotting at the base of their stem! Help!

This may be from a fungal pathogen referred to as "damping off." Certain crops are especially susceptible, like Swiss chard and spinach. This pathogen thrives in cold wet environments so make sure you're letting the soil surface dry down a bit before watering your plants.