



March is for Gardening: Vegetable Seed Starting

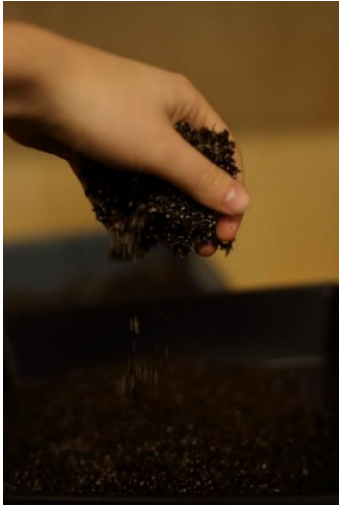
*There’s nothing like eating a just-picked cherry tomato or making a salad filled with vegetables that you grew yourself! This can be the year you start a garden in your backyard, join a community garden, or put some pots on your patio and develop your green thumb. You can always visit your local garden center and purchase seedlings. But you can choose from many more varieties (e.g., purple carrots, black cherry tomatoes), save money and have some fun by **growing your own plants from seed**. But where to begin?*

To watch a detailed program on starting your own vegetable seeds, visit the [Duke Farms Seed Starting Class on YouTube](#).

What to grow?

Grow what you like to eat! If you and your family eat salad several times a week, you might grow the ingredients for your salad. If you can’t wait for tomatoes and summer squash to be available at your local farmers market, grow a few varieties yourself.

Vegetables are divided into cool-season crops (those that grow best in cooler weather) and warm-season crops (those that prefer long, warm summer days). Cool-season vegetables should be placed into the garden either as soon as the soil can be worked in the spring, or when the soil and air have reached certain minimum temperatures. Warm-season crops require higher soil and air temperatures; they are always planted after the last frost date.



Certain vegetables need to be planted as transplants while some can be started from seed directly in the soil. Many of warm-season vegetables, including tomatoes, peppers, squash, and beans, are native to warm climates and need more sunlight and warmth than a typical growing season in our area would give them. They produce best when they are started indoors so that the plants are well-developed when planted in the ground after the chance for frost has passed. Starting any plant indoors gives it a jump on the growing season often allowing the grower to begin harvesting sooner. There are a few crops, such as carrot and radish, that simply do not like to be transplanted so therefore should be directly seeded into the garden.

Here is a handy chart for our recommendations on whether to **transplant** or **direct seed**. The transplants can be grown from seeds at your home.

- | Crops that do better as transplants: | |
|--------------------------------------|-----------------|
| - Broccoli | - Cabbage |
| - Cauliflower | - Kale |
| - Collard greens | - Celery |
| - Brussels sprouts | - Leeks |
| - Sweet potato | - Onion |
| - Tomato | - Basil/parsley |
| - Pepper | - Eggplant |

- | Transplants or direct seed, optional: |
|---------------------------------------|
| - Summer & winter squash |
| - Cucumber |
| - Melon |
| - Beans |
| - Lettuce |
| - Okra |
| - Fennel |



Visit the seed section of your local garden center (they generally stock varieties that will perform well in your area) and browse seed company catalogs/websites for varieties you want to try. There are many seeds companies to choose from; a few of our favorites are:

- [Territorial Seed](#)
- [High Mowing Seeds](#)
- [Johnny's Seeds](#)
- [Renee's Garden](#)



Cabbage seedlings being grown in cells. These small plants will be transplanted to the garden when they are about 5 weeks old.

Activity: Visit one of the websites above and see how many different varieties of tomatoes there are available!

Cool-season crops include:

- Beets
- Broccoli
- Brussels sprouts
- Cabbage
- Carrots
- Cauliflower
- Collard greens
- Garlic
- Herbs (parsley, rosemary, dill, cilantro)
- Kale
- Leeks
- Lettuce
- Onions
- Parsnips
- Peas
- Potatoes
- Radishes
- Spinach
- Swiss chard
- Turnips

Warm season crops include:

- Basil
- Beans (bush and pole varieties)
- Corn
- Cucumbers
- Eggplant
- Melons
- Okra
- Peppers
- Pumpkin
- Summer squash
- Sweet potatoes
- Winter squash



When to start seeds?

It is critical to know which season your seeds belong to so that you can determine when to start them. They need to be large enough to transplant outdoors at their recommended planting time, yet they can't be started too early, or they will become rootbound and stressed in their tiny pots. Knowing when to start your seeds and transplant them outdoors will help to maximize your harvest. The hardiness zone provides important information for growing vegetables, including the latest average frost date in the spring, the first average frost date in fall and the average temperature. The US Department of Agriculture (USDA) has developed a Hardiness Zone map to determine your zone and help determine which plants are most likely to thrive in your area. We are in New Jersey, and most of New Jersey is in hardiness zone 6.

Activity: Using the [USDA Plant Hardiness Zone Map](#), locate your hardiness zone.

Plants **germinate** (begin to sprout) and grow at different rates, so the start dates for your vegetables will vary. Cool-season crops started indoors can go outside up to 4 weeks before the last frost. Warm-season crops can be planted only after the danger of frost has passed. Once you know your latest spring frost-date, you can determine the date you plant your crops outside. Then you must work backwards to find to determine the start date for your seeds.

Plants **germinate** (begin to sprout) and grow at different rates, so the best start dates for your vegetables will vary. If you know the average number of weeks between planting seeds indoors and transplanting seedlings to the garden, you can work backwards to determine when to start your seeds.

For instance, in our garden zone 6A, we usually transplant kale outside around April 15. Since it needs about a month of growth, we often begin kale seeds on about March 15. A simple seed starting rule for most warm-season vegetables is to start them 6 weeks before your last frost date. Squash, cucumbers, melons and beans should be started only 3 weeks before the last frost date because they are fast growers. When in doubt, the information on the seed packet should tell you when to start your seeds.

This [seed calculator](#) from Johnny's Seeds that is adjustable uses your spring frost date may be helpful.

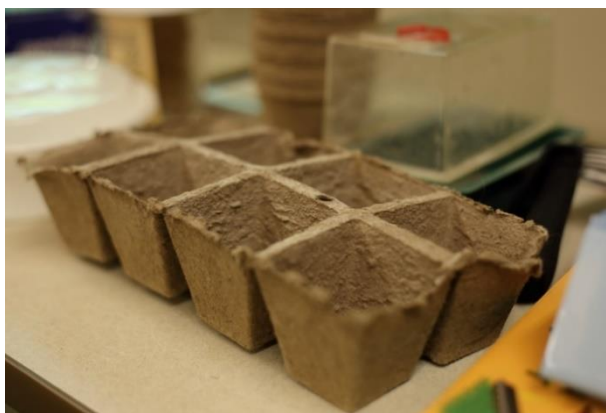


Tomato seedling- seeds should be started 6-8 weeks before your last frost date.

How to Start the Seeds

A few supplies are needed for seed starting:

- **Planting medium:** Use a fresh, sterile seed-starting mix that is light and fluffy and designed to hold just enough moisture. Do not use soil from the garden! An organic seed-starting mix is best, especially if you are planning to follow organic growing practices throughout the season- we highly recommend it!
- **Large bowl or bucket:** to pre-moisten your seed starting mix before filling the trays/containers
- **Seed-starting trays or pots with drainage:** A variety of manufacturers offer specially designed seed starting trays with cell inserts that are very useful. Some even offer kits that include soil or seed-starting pellets and plastic covers that hold in humidity. You can also use biodegradable pots that can be planted directly into the garden, so the plants roots are not disturbed. You can also use recycled materials found at your house. Any plastic container with added drainage holes can be used.



Planting tray that will compose into the soil when planted.

- **Light:** A very sunny southern exposure window or a grow-light is needed. Without enough light, seedlings will grow long and spindly.
- **Water:** small watering can or a spray bottle work well to water gently
- **Labels and markers:** We recommend a permanent or industrial strength marker. You can purchase plant markers, recycle something or re-purpose items (e.g., popsicle sticks).
- **Cover for the seed tray or a paper towel/plastic wrap (recommended):** Covers hold in moisture and warmth for faster, more even germination. Covers are removed after seeds have germinated.
- **Heat mat (optional):** warms the soil to approximately 60 degrees F for optimal germination.
- **Organic liquid fertilizer (optional):** If plants will stay in pots for more than 4 weeks, adding a mild fertilizer to the water once a week will ensure they have adequate nutrition.
- **Small fan ():** circulating the air around transplants reduces chance of fungal or mold issues as well as increasing strength of the stem for stronger seedlings.



Follow this process to start your seeds:

1. Place your seed-starting mix into a large bowl/bucket and add water, a little at a time, to moisten it. The mix should be moist enough to hold together when you make a ball in your fist, but not drip water.
2. Place the moistened seed-starting mix into your trays or pots. Fill each cell/pot and press down to remove any air pockets that may be present. You may need to fill the cells with additional soil if more room was created.
3. Carefully place one to two seeds into each of the cells/pots. Generally, the seed should be placed into the soil no more than the depth of the seed. Your seed packet will contain specific information on how deep the seed should be. If needed, lightly cover the seed with additional seed-starting mix.
4. Gently water the newly planted seeds. You can use a small watering can or spray bottle. While water is essential for germination and plant growth, be careful not to overwater your seedlings. The soil can be watered from the top (or the bottom if you are using specially designed trays) but should be kept only moist and not soaking wet. You should check your seedlings daily.
5. Using your marker, write the name from the seed packet and date planted on a label. Put the label into the cell; if the tray contains all the same plant, you can use only one marker. Be sure to uniquely identify each of the seeds you are planting. As the seedlings grow, it will be hard to tell them apart.
6. If you are using a heat mat, place the seed tray onto the mat. During germination, seeds benefit from warm soil. Heat mats warm the soil an additional 10°, which promotes faster germination and healthier plants. If you use a heat mat, it can be removed once the seedlings have grown to about half an inch and the room is between 60° and 70°.
7. Cover the seeds with the plastic lid, a piece of moistened paper towel or a plastic wrap cover. The cover helps to retain moisture and humidity. The right moisture level will cause condensation to develop – that's ok! You don't need to water the tray as long as there is condensation on the lid. The cover needs to be removed once the seedlings have begun germinating.
8. Once the seeds begin germinating and the cover has been removed, move the tray to a strong light source. A very sunny southern exposure window may be sufficient, but artificial plant lights will ensure that your plants get the light they need every day, regardless of the weather. Specially designed grow-lights are available in a wide assortment of sizes and prices, from many manufacturers. You can use these lights on a timer to ensure that the plants get ~14 hours of light per day. It's best if these lights are about 3"- 4" above the top of the plants.
9. Check on your seedlings every day. They will likely need to be watered daily. As they grow, adjust the grow-light to be 3"-4" above the plants.
10. When a seed sprouts, the first set of leaves that develop are called **cotyledons**. The food that's needed to grow these first leaves is contained right inside the seed. When the second set of



A handful of seeds, ready to be planted.



"true" leaves appear, the seedlings should be given a weekly dose of diluted (1/2 strength) organic, liquid **fertilizer** solution.

11. A small fan on low speed blowing over your seedlings will strengthen them as they grow. It's not required, but it will help them adjust more quickly to outdoor conditions.

How to Get Seedlings Ready for the Outdoors

Your seedlings have developed in an environment with consistent light and temperatures, and even after the danger of frost has passed, they must slowly adjust to the strong sunlight and varying day and night temperatures of the outdoors through a process called **hardening-off**. It's best to take your time with this process, taking at least 1 week and preferably 2 weeks. This involves taking them outside for just a couple of hours each day at first and then gradually lengthening that time until they are ready to spend a whole day and eventually nights outside. It's best to begin the process on an overcast day when it is not windy to minimize the stress on the plants. Move them to direct sunlight slowly; place them in a spot with part shade in the afternoon first, if possible. After a few days, you may begin leaving them out overnight but be aware if the weather changes and the evening temperature dips significantly, you will need to cover them or bring them inside. The last or two before planting they should be spending 24 hours outside.



Fennel seeds – freshly planted. It will be transplanted to the garden when they are about 4 weeks old.

Once the seedlings are hardened-off, you are ready to plant them into your garden. Revisit the seed package for information on how far apart the plants should be placed when planted. The seedlings look small, but once they are placed into the garden they will grow quickly. If you aren't sure, this [Gardening Know How Plant Spacing Guide](#) can be helpful. If you have amended your soil with compost, you likely do not need extra fertility. However, some gardeners choose to put a small amount of all-purpose, organic, granular fertilizer in the planting hole at the time of transplanting. Water them in well at the time of planting to settle the soil and encourage root growth.

Your seedlings will begin growing quickly in the garden. Continue to watch them carefully, being sure that they have the right amount of moisture. If the temperature drops overnight in the first week, you might consider covering your transplants for to prevent them from getting stressed. After a week, you can cut back on watering to about once or twice a week and soon you will be reaping the rewards from your garden!



Activity: Gather your supplies and watch the Duke Farms Community Garden Coordinator's detailed program on starting your own vegetable seeds at the [Duke Farms Seed Starting Class on YouTube](#).