

SEED STARTING 101

[HTTPS://WWW.BOOTSTRAPFARMER.COM/BLOGS/HOW-TO-GROW-SEEDLINGS/THE-ULTIMATE-SEED-STARTING-GUIDE](https://www.bootstrapfarmer.com/blogs/how-to-grow-seedlings/the-ultimate-seed-starting-guide)

STARTING SEEDS INDOORS FOR YOUR GARDEN

Although growing a garden with store-bought transplants is fine, it does not offer you the cost savings, variety of choices, or control that starting your own seeds indoors does.

Many garden supply stores only offer a few types of tomatoes or peppers yearly, even though hundreds of varieties are available. Learning to start your own transplants from seed each year means that you can grow different types chosen for their beautiful colors, unique flavors, and suitability to your precise growing zone.

SOWING AND GERMINATING SEEDS FROM SEED PACKETS

Starting your own seeds from packets also gives you control over timing. Allowing you to be ready to plant your gorgeous starts outside as soon as the weather permits and not wait until they are available at your local nursery.

Most vegetables and flowers can be started indoors in cell trays or small pots for later transplant into your garden.

TOP 10 SUPPLIES NEEDED FOR STARTING SEEDS INDOORS

1. Seed-starting cell trays or seed-starting pots
2. Sterile planting media (IE. seed starting soil mix)
3. Table or Shelf (this can be a basic shelf or an automated grow rack)
4. Lights (LEDs or T5 shop lights)
5. Seeds
6. Watering Can or Mister
7. Labels or tape and a pen
8. Rack fans or Oscillating Fan
9. Heat Mat
10. Larger pots for up potting

HOW TO PLANT INTO CELL TRAYS

FOR SMALL SEEDS LIKE LETTUCE, BRASSICAS AND TOMATOES.

Fill your cell trays with potting soil to the top. Take another cell tray and stack it on top of the cell tray you are planting into. This will pack down the dirt and create little divots to sow seeds into. Plant 2-3 seeds per cell and cover with soil around one to two times the depth of the longest side of the seed. This means that for a seed that is $\frac{1}{4}$ of an inch long, you will cover it with $\frac{1}{4}$ to $\frac{1}{2}$ inches of soil.

FOR ALL PLANTED SEEDS.

Water your newly planted seeds liberally but gently. We recommend using a spray bottle or mister. Cover your tray with a humidity dome and place it on your shelf or a heat mat if using one. The humidity dome will maintain the perfect conditions for your seeds to germinate. Be sure to label your seedlings!

GERMINATING SEEDS WITH A HUMIDITY DOME

Once you have planted your seeds into your cell trays, it is wise to cover them with a humidity dome to maintain the best conditions for your seeds during germination. Humidity domes increase germination success when used correctly.

Keep the humidity dome on the newly seeded tray until the first sign of germination. After that, remove the dome and set the tray under the lights. It is essential to remove the humidity dome at the first sign of germination, as mold can occur. Once under the lights, seedlings will need airflow and water.

HOW DO YOU KEEP SEEDLINGS WARM?

Seedlings should be grown in a closed environment that is at least 60°F. **The soil temperature needs to be in the range between 65°F and 80°F, depending on the variety.** Frost-tolerant plants like broccoli will do fine in the low end of this range, while tomatoes and peppers will germinate and grow much better above 75°F Both grow lights and heat mats help maintain temperatures in this optimal range.

HOW LONG DOES IT TAKE FOR SEEDS TO SPROUT INDOORS?

Typically, vegetable seeds sprout in 3-4 days under the right conditions. Some fruits, flowers, and herbs can take 14 days or longer to germinate. Consider pre-soaking your seeds for faster germination to speed up the process. Germination rates can slow substantially if you germinate seeds in cooler soil temperatures. For best results, use supplemental heating like a heat mat, and keep the humidity levels consistent by using a humidity dome for the highest germination rates.

WHAT DO I DO AFTER MY SEEDS GERMINATE?

After your seeds sprout, remove your humidity dome and place directly under grow lights. **Keep the soil moist but not saturated until you are ready to harden off your seedlings.** Bottom watering is the best method to keep seedlings healthy.

DO YOU NEED A GROW LIGHT TO START SEEDS INDOORS?

Setting up an ideal seedling growing area does not need to be expensive. Direct lighting for your growing seedlings is recommended for 14-16 hours daily. This can be done with a simple led light hung around 6 inches above the seed tray. A baker's rack works very well for this.

The three most important things a seedling needs are proper airflow, adequate light, and a consistent temperature range between 65°F and 80°F. You can obtain all these conditions with the appropriate equipment regardless of where you are growing.

WHEN TO TRANSPLANT SEEDLINGS FROM A CELL TRAY?

Typically, your seeds will **stay in their seed tray for 4-6 weeks**. After this period, you will either need to transplant the new seedlings into larger pots or transplant them outside. Check your seed instructions and pay attention to your frost dates before transplanting young plants outside. A developed root system needs to be in place before successful transplanting of young plants can happen. Another thing to look for is the development of the "true" leaves.

UNDERSTANDING UP-POTTING: THE WHAT AND WHY

Gardeners often up-pot their plants in the spring or early summer when most plants are entering a period of vigorous growth. When to up-pot can vary depending on the specific type of plant and its growth cycle. Up-potting is a vital part of maintaining and improving plant health for several reasons:

1. **Space for Root Growth:** As a plant grows, its root system expands. A larger pot allows these roots to spread, preventing overcrowding and encouraging healthier growth.
2. **Nutrient Availability:** Up-potting usually involves replacing the old soil with fresh, nutrient-rich soil, giving the plant access to essential nutrients to support growth and development.
3. **Improved Water Management:** Larger pots hold more soil and more water. This can help maintain consistent soil moisture levels, preventing overwatering and underwatering.
4. **Prevents Root-Bound Plants:** Their health suffers when plants become root-bound (their roots form a dense network that impedes their ability to absorb nutrients and water). Up-potting prevents this by providing ample space for roots to grow freely.

5. **Disease Prevention:** Overcrowded plants are more susceptible to diseases and pests. Giving each plant enough space through up-potting can reduce these risks and promote healthier plants.
6. **Promotes Vigorous Growth:** With more space, fresh nutrients, and optimal water management, plants can grow more vigorously, producing more foliage, flowers, or fruits.

Remember, while up-potting offers numerous benefits, it's vital to do it correctly and at the right time to avoid causing stress or damage to the plants.

SEEDING SUCCESS: UP-POTTING FOR EARLY STARTERS

1. **Temperature Control:** When you start seeds indoors and use up-potting, you can control the temperature and growing conditions more effectively than in an outdoor garden. This allows you to start seeds earlier because they're not subjected to the unpredictable and often harsh conditions of late winter or early spring outdoors.
2. **Healthy Root Development:** Starting seeds in smaller pots and then up-potting them allows the seedlings to develop strong, healthy root systems. This process can help the plants establish more quickly once transplanted outside.
3. **Avoiding Transplant Shock:** Up-potting allows seedlings to gradually adjust to larger containers before moving to the garden. This step-by-step adjustment can reduce the risk of transplant shock, stunting growth, and even killing young plants.
4. **Optimal Space Utilization:** Up-potting allows you to maximize your indoor growing space. You can start with many seeds in small pots. Then, as they grow and you identify the most vigorous seedlings, you can up-pot these into larger containers.
5. **Extended Growing Season:** Overall, by starting seeds earlier indoors and using the up-potting method, you effectively extend the growing season. This can result in earlier harvests and potentially higher yields.

GENERAL UP POTTING GUIDELINES

Fast-Growing Vegetable Plants: Fast-growing plants, such as tomatoes, cucumbers, or zucchini, often must be up-potted more frequently - typically every 2-3 weeks. As they grow quickly, these plants tend to outgrow their containers rapidly and require more space and nutrients.

Lettuce, herbs, peppers, eggplant, squash, and radishes are also known to thrive when up-potted, especially for gardeners with limited ground space for a traditional garden.

Finally, members of the cabbage family - including cabbage itself, broccoli, cauliflower, and brussels sprouts - can benefit from being planted a couple of inches deeper than they were in their original pots, which is a form of up-potting.

WHEN TO TRANSPLANT SEEDLINGS OUTSIDE

Transplanting tender seedlings outside is a regionally specific farm or garden task. For colder growing zones, transplant your seedlings all at once in the late Spring once nighttime temperatures are reliably above 50°F. If you will be growing in a hoop house or cold frame you can move up your planting time by a number of weeks.

The best time to transplant any plant seedlings, whether it is one you have purchased from a local nursery or started yourself in seed starting trays, is once it has reached the proper stage of growth and outside conditions are appropriate.

AT WHAT STAGE OF GROWTH DO YOU TRANSPLANT SEEDLINGS?

Waiting until the seedling develops its second set of true leaves is one way to determine if a seedling is ready or not - but that is not always a hard and fast rule. Seedlings grown in cell trays need a sufficient root system in place before transplanting outdoors or into a cold frame. If the roots have not developed enough before you attempt to transplant outdoors, the root ball may fall apart when removed from the tray. This can break the fragile new roots and stunt the growth of your plants.

Having a strong root system is the best indication. You can check for proper optimal root growth by grasping one of your seedlings at the soil surface and gently pulling it from the tray. The entire plug should slide out of the cell tray. If the seedling is immature, it will pull out and leave most of the potting soil behind in the tray.

If the seedling is overdeveloped it will come out easily but be root bound. **Root binding happens when seedlings are left in plastic pots or trays for too long** and the roots encircle the entire plug. Root bound seedlings are easy to identify because there will be numerous roots sticking out of the drainage holes, when you remove the plug, you will see mostly roots with little growing media.

HOW TO GET SEEDLINGS WITH OPTIMAL ROOT GROWTH FOR TRANSPLANTING.

The three best ways to achieve a healthy root system when growing your own plants from seed are:

- Use a bottom watering system to avoid compacting the soil.
- Plant in properly sized trays that encourage downward root growth.
- Pot up your seedlings before they become root bound if you cannot transplant them yet.

UP-POTTING TIPS

Choosing the Right Pot Size: The new pot should be just one size larger than the plant's current pot. Going too large can lead to overwatering, as the excess soil retains more water than the roots can absorb. Typically, choose a new pot that is 1-2 inches larger in diameter for small plants and 2-4 inches larger for bigger ones.

Selecting the Right Soil: The type of soil you use plays a significant role in your plant's health. Opt for a high-quality potting mix that suits your specific plant's needs. For most plants, general-purpose potting soil works well. However, some plants, like succulents and cacti, need a well-draining soil mix, while others, like ferns, prefer a more moisture-retaining blend.

UP-POTTING PROCEDURE:

1. **Water the Plant:** Water the plant very lightly, a few hours before up-potting to reduce root stress.
2. **Remove the Plant:** Gently guide the plant from its current pot, carefully not to damage the roots. If the plant is stuck, press the sides and bottom of the pot to free it, or use a popsicle stick or a Widger Dibbler Set to help pry the plants out.

Helpful tip: Watering heavily 12-24 hours before transplant will help keep the soil intact while pulling out of the cells.

1. **Prune the Roots:** Examine the root ball. If you notice any dead or rotting roots, prune them.
2. **Prepare the New Pot:** Add some potting mix to the new pot and place the plant inside. The plant should sit at the same depth as in the previous pot. Fill around the plant with more soil, pressing gently to remove air pockets.

Aftercare for transplanted plants:

1. **Water Thoroughly:** After repotting, water the plant thoroughly to help the soil settle around the roots.
2. **Provide Rest:** Keep the plant in a quiet, shaded area for a few days after repotting to help it recover from the shock of being moved.
3. **Monitor the Plant:** Monitor your plant for a few days after repotting to check for signs of stress. Some wilting or leaf drop is normal, but prolonged symptoms could indicate a problem.
4. **Resume Care:** Once the plant has settled into its new pot, resume your normal care routine.

HOW DO I CHOOSE THE BEST SEEDLINGS TO TRANSPLANT?

When choosing seedlings from a nursery to transplant into your home garden there are a few things to look for to ensure you get the healthiest plant starts you can for a successful garden. You want big and healthy stems and leaves but not so big that the plant has overgrown its small pot and become root bound.

- Avoid leggy plants with tall thin stems. These have likely not been receiving direct sunlight and will possibly fall over when planted outside.
- Choose smaller, compact seedlings. They are ready to grow big once you plant them.
- Check the foliage for discoloration and damage. Leaves should be uniformly green (unless it is a plant with variegated foliage).
- Look at the underside of the leaves to be sure there are no hitchhiking pests like aphids or insect eggs.
- Check the plants for signs of disease including yellowing of the leaves, brown spots and dried out tips.
- Look at the bottom drainage holes, a few visible roots are ok but if there are a lot sticking out through the holes it is probably root bound.
- Look for moss or signs of fuzzy mold on the soil surface. These are likely signs that the seedlings are old stock or of overwatering both of which can cause weak transplants.
- Squeeze the sides of the pot. It should give a little under pressure showing that there is still some loose potting soil, meaning the roots have a little space left to grow into.
- Too little soil moisture is just as problematic as too much so make sure the potting mix is moist but not sopping wet. Root bound seedlings will often become hydrophobic and not take up water properly.
- Choose plants that have only leaves and possibly buds. Vegetables and fruits that have already begun to flower and fruit will stay small even if they are given more space.

SHOULD I FERTILIZE MY SEEDLINGS BEFORE I PLANT THEM?

Most seedlings will grow just fine without additional feeding. In fact, too much nutrition in the growing medium can cause seedlings to be weak or prevent seeds from germinating. Using a balanced potting mix that contains some aged compost or worm castings will provide your plants with everything they need while they are small.

If you are using a sterile seed starting mix like ProMix that contains only coco coir, peat moss or perlite to germinate your seeds they may require a **very light feeding once they have a second set of leaves**. This only applies if you will be continuing to grow them indoors for a while beyond the second set of leaves.

Buying a well-rounded potting soil will help to ensure that your seedlings are covered nutritionally. If you are planning on potting up things like tomatoes, peppers, cucumbers, or squash and have started them in a sterile seed starting mix you can then pot up into a larger container with a balanced potting soil. This is more effective than using garden soil which may not have a balanced nutrient profile.

WATERING SEEDLINGS FROM BELOW

Watering from below offers the most effective and reliable of the two options. It relies on capillary action, wicking of the water through the soil from the bottom working its way up to the top.

HOW LONG CAN SEEDLINGS STAY IN CELL TRAYS?

The length of time a seedling can stay in a cell tray depends on the size of the cells. Deeper and larger cells both allow for extended growth as the plant has more room. Seedlings otherwise can become root-bound if not given adequate space for the roots.

Typically, after sowing the seeds, the cell trays are used for around 3-4 weeks before transplanting occurs. Choose your sizing according to how long the transplant must stay indoors before getting transplanted into the garden.