Bronx Green-Up □ **THE NEW YORK BOTANICAL GARDEN**


Bronx Green-Up, the outreach program of The New York Botanical Garden, provides horticultural advice, technical assistance, and training to community gardeners, school groups, and other organizations interested in improving urban neighborhoods through greening projects. At the heart of Bronx Green-Up are the community gardens of the Bronx and a compost education program.

# Starting Seeds Indoors

## Materials

- Seeds
- Seed-Starting Mix
- Seed-Starting Tray or Containers
- Tags for Labels
- Watering Can and Spray Bottle
- Light (sunny window or fluorescent light)

## Sowing Seed

1. Prepare seed-starting mix by moistening it. The mix should be moist like a damp sponge.

2. Fill containers with mix, making sure to fill each cell. Using another clean cell pack or your fingers, press down on mix while being careful not to pack too tightly. Take a pencil or a ruler and run it over the top of the seed-starting tray so that the medium is leveled with the tray in each cell.

3. Prepare seed if necessary. Follow the directions that are listed in the seed package. Some seeds need to be **scarified** or **stratified**.
   **Scarification** is when you scratch the seed coat so it can more easily absorb water.
   **Stratification** is exposure to either a cold or hot period. The instructions on the seed package will specify the appropriate amount of time.

4. Using your fingers, make holes in the soil of each cell of the correct planting depth. If there are no recommendations on the back of the package, the general recommended depth of the hole is at least 2 to 3 times the width of the seed. Space the seeds according to the seed packet instructions.

5. Put your seed into the holes and cover it with the appropriate amount of soil to top it off.

6. Label your trays. The tag should include the name of the seed, the date you planted it, and the day it germinates.

7. After everything is labeled, place the seed-starting tray into a second tray, the bottom-watering tray. Fill the bottom tray with water. The seed will absorb the water through the bottom. When you think that the seed has absorbed all the water and seems saturated, empty out the excess water.

8. Place the humidity cover over the seed-starting tray. You can either place newspaper over the top of the humidity cover or place the entire tray in a dark place. Seeds need to be in the dark until they germinate. Once they germinate, they need light to start growing. Remember to remove the cover after they germinate.

9. Make sure your seedlings receive sufficient light. It is best is to provide supplemental artificial light. Standard fluorescent tubes work well if plants are kept close to the light. You may also place your plants close to a sunny window.

## Watering

Water plants from the bottom: Use your watering can to pour water into the bottom tray and use your spray bottle to mist seedlings from the top. Be sure that your water is room temperature; cold water can slow down the germination and growth process. Keep the trays moist, but not too wet.

## Fertilizing

Do not fertilize your seedlings until they develop their first true leaves. True leaves resemble the leaves of a mature plant. When fertilizing, it is only necessary to use half of the recommended dose. Give diluted feedings about every two weeks.

## Seedling Diseases

The warm, humid conditions that promote germination and seedling growth are the same conditions that foster a fungal disease called **damping off**. This can happen if seeds or seedlings are over watered, too crowded, or poorly ventilated. When damping off occurs, the seeds tend to rot or seedlings shrivel and collapse on top of the soil. If this happens to your seeds, it's best to just throw them away and start over with new seeds. If you plan to use the same container, sterilize it first to be sure that there is no trace of the fungus.

## Transplanting

Transplant seedlings to a larger container when they start to get crowded in their tray. If the seedlings get crowded, they will be weaker, susceptible to disease, and not uniform in size.

## Getting Ready for the Garden

After the danger of frost has passed (in New York City this is generally by May 15), it is safe to transplant your seedlings into the garden. Remember that they have been protected and sheltered indoors with warm temperatures. So, when you are ready to put your seedlings outdoors, it is important to first acclimatize them to the outdoor temperatures. Start by bringing the plants outside for two hours per day and gradually increase the time to a full day over the course of a week or so. This process is called **hardening off**.

## Into the Garden

The day before transplanting the seedlings, water them well; this helps limit the shock of transplanting and ensures that your seedlings are turgid (sturdy). Also, remember that the seedlings are still fragile; transplant them in mild conditions—low light, mild temperature, and low wind.

## Why won't my seeds germinate?

Most seeds, if given water, an appropriate soil mixture, and warmth, will germinate; however, here are some reasons why you might have trouble.

**Water:** Some hard-coated seeds like morning glories, corn, and beans may be soaked in water to speed up germination. Many desert seeds need to be exposed to water to remove an inhibitor that stops them from germinating during dry spells.

**Soil Conditions:** Seeds may not germinate if the soil is too wet or too cold, or if the soil has been allowed to dry out. Soil that is too compact also can prevent germination; this is why seed-starting mixtures usually contain lighter and looser material.

**Temperature:** Most garden seeds germinate best indoors with temperatures between 65 and 75 degrees Fahrenheit. Annuals that come from tropical climates generally can germinate at any time. Plants from colder climates germinate in the spring, not the winter; these seeds must go through a cold period. Sometimes alternating cold and warm temperatures are applied to encourage the seed to germinate. This process is called **stratification.**

**Light:** Some very tiny seeds such as lettuce need to be on the surface of the soil; they do not have the energy to push through the soil, and they will not germinate without light. The seed senses the light by a pigment called **phytochrome.**

**Seed Coat:** Some seeds have a very hard seed coat, which water can't penetrate. Sometimes you need to cut or nick the seed coat with a knife or with sandpaper. In extreme cases, like with the Kentucky coffee tree, sulphuric acid is used. The cutting of the seed coat is called **scarification.**

**Viability:** A seed may not germinate because the embryo is damaged or incomplete. Another reason why seed viability may be affected is because the seeds have been stored too long or under poor conditions.

**Timing:** Some large seeds such as acorns or horse chestnuts take a long time to germinate, sometimes up to two years. In the first year they produce a root, and in the following year cotyledons (seedling leaves).