

GROWING NATIVE PLANTS FROM SEED

Growing your own seedlings from seed offers you more flexibility and control over your garden. You can choose your favorite varieties, grow the number of plants you need, and work within the planting dates that suit your growing area.

Growing your own seedlings offers a number of benefits:

- It is less expensive than purchasing nursery seedlings.
- There is a greater selection of seeds available in comparison to the standard plant varieties at most nurseries.
- It provides a little gardening therapy during the winter months when the ground is under a layer of snow.

A. Get Organized

Make a plan. A key to any successful garden is planning. The first step is to decide what you want to grow and make a seed list. Then it is helpful to plot out your garden beds so you have an idea on how many transplants you will need to grow.

Developing a seed-starting schedule ahead of time will provide a guideline so you know when to start your seeds.

- Get things organized and take inventory so you know what you have on hand and what you need to purchase.
- You can make seed boxes divided into sections with index cards and labeled. Each seed package is kept in a zipper bag to keep it dry. Most seeds will keep for several years when stored in a cool, dry location.
- The seeds will have a reduced germination rate the older they are. Even if they do germinate, they may not have the vigor to produce healthy plants like when they were new. It all depends on the quality of seeds and how they are stored. When in doubt, it is best to purchase fresh seeds rather than jeopardize your crop's success.

You can do a germination test to see if your seeds will sprout for you.

- **Materials:**
 - Paper towel cut in half
 - Zipper bag
 - Seeds
 - Water
 - Marking pen
- **Procedure:**
 1. Moisten a paper towel and squeeze out excess water. The towel should be damp, but not dripping wet.
 2. Spread the damp paper towel out on a clean surface and fold in half.
 3. Select at least ten seeds from the package you are testing.
 4. Spread the seeds out on one-half of the towel, so they are not touching.
 5. Fold the towel in half sandwiching the seeds between the two layers. Press down gently to make sure seeds come in contact with the damp paper towel.

6. Place the paper towel and seeds in a zipper bag and seal it to keep it from drying out.
7. Mark the bag with the date and variety of seed. Place the zipper bag in a warm place away from direct sunlight.
8. Every three days, check to see if the seeds have sprouted. Re-moisten the paper towel if it dries out.

After the predicted germination period, count the seeds that successfully sprouted and calculate the percentage that germinated out of the total tested. Example: if 9 out of 10 seeds sprout, you have 90% germination rate.

If the germination is greater than five sprouted seeds (50% percent) I will use the seeds knowing that I will have to sow a little heavier to make up for the lower germination rate.

When you should sow the seeds:

- Start some seeds too soon and you will end up with lanky plants under the lights. Too late and the plants will be too weak when transplanted to the garden or may not mature in time to produce before your frost. To help keep you organized, it is a good idea to develop a seed starting schedule. A seed-starting schedule provides a guideline of when to sow seeds and when to transplant seedlings to your garden. Planning a seed starting schedule for the first time can be a bit daunting. It becomes easier the following year because you can use the same schedule and adjust according to your notes and observations.

How to Develop a Seed Starting Schedule:

- **Find Your Last Expected Frost Date.** The key information to establishing the seed-starting schedule is the last expected frost date for your area. This date will be used as a starting point for your schedule. **A reliable source for finding planting dates is the Ontario Ministry of Agriculture and Rural Affairs <http://www.omafra.gov.on.ca/english/crops/facts/climzoneveg.htm>* Don't become too concerned if you find that different sources provide you with slightly different last expected frost dates. It is only an estimate and may vary from various sources, year-to-year, or even from one side of the city to another. Select the average date among the sources as your starting point.
- **Set Up a Chart.** I use a spreadsheet with the following headers: Species name, # of plants, Germination Code, Stratification Date, Sowing Date, Germination Date, Repotting Date, Hardening Off Date, Transplant Date and Notes. Estimate rough dates and make specific corrections as needed.

B. How to propagate native plants from seed

OUTDOOR PROPAGATION

- Decide on location: in established garden area, in prepared seed bed, in raised bed, or in containers. Locate in sunny sheltered area with access to water.
- Use soilless mix if sowing seeds in containers.
- Decide if you wish to sow in fall or early spring (fall is preferable for seeds, spring is better for transplants).
- No stratification is necessary for fall-sown seeds.

- Take measures to protect seed bed and seedlings from rodent damage (wire hardware cloth cover) and weather extremes (umbrella or dome/hoop house cover).
- After seeds germinate in spring, thin, fertilize, repot and transplant as described below.

INDOOR PROPAGATION: 10 STEPS

- **Step 1: Set up a lighted seed starting area:** In order to grow healthy seedlings, you will need some supplemental lighting. Seedlings need at least 12-16 hours of light each day. I set my timer on my lights for 16 hours on, then 8 hours off. Keep the lights about 2-inches above the seedlings. Adjust as the plants grow.
- **Step 2: Gather growing containers to start your seedling:** These can be seed-starting flats, peat pots, toilet paper rolls, newspaper pot, or any recycled container with a few drainage holes poked into the bottom. You can omit growing containers all together by using a soil block maker to compress the soil into a cube. Whatever container you choose, wash them with warm soapy water and rinse well. Place them in leak proof trays or containers to prevent water from dripping.
- **Step 3: Prepare your seed starting soil:** Use new seed starting mix that's made for growing seedlings. Using soil from your garden or re-use potting soil from your houseplants can introduce disease to your young and vulnerable seedlings. Starting with fresh, sterile, seed starting mix will help ensure healthy seedlings.
 - **Making your own** is simple, and much cheaper than buying it from a store. Just mix together equal amounts of perlite, vermiculite, and coir (or peat moss). This light mix drains quickly to prevent rot, and makes it easy for the sprout to emerge from the surface. Moisten the seed starting mix thoroughly, then fill containers to within ¼" (6mm) of the top. Use any clean object to gently press the mix into a firm, level surface. Let excess water drain before you continue.[6]
 - If you're using a **store-bought mix**, check whether it contains compost. If it does, you won't need to fertilize your seedlings. (Don't try to add compost to a homemade mix for your first project — it's more trouble than it's worth.)
 - If you use peat moss instead of coir, add hot water to make it easier to mix in. Since peat moss is acidic, it helps to add garden lime (calcium carbonate) to balance it out. Try ¼ tsp of lime per gallon of potting mix.
 - **Pre-moisten** the seed starting mix before filling your containers. Use a clean bucket or bowl and mix a little warm water into the seed starting soil. You will want the soil mix slightly damp, but not soaking wet. Fill your containers with pre-moistened seed starting mix to within 1/2-inch of the top of the container. Press gently to remove any air pockets.
- **Step 4: Sow your seeds:**
 - **Cover** seeds based on their size. As a rule of thumb, bury seeds to a depth twice the diameter of the seed. Most tiny seeds need light to germinate, including petunia, lettuce, and snapdragon seeds. Just leave these on the surface of the mix. Dry vermiculite or milled sphagnum moss (not peat moss) are ideal for covering seeds, but you can use dry seed-starting mix instead. Sprinkle the material on lightly. If you press it on hard, the sprout may

have trouble breaking through the compact layer. Press down gently so the seed makes contact with the soil, and mist the soil surface with water.

- **Label** the containers with the seed variety and sowing date. Cover the containers with a humidity dome to keep in moisture. Labels made with plastic and paint pens are durable.
 - **Plant** your seeds. If the seed starting mix has dried out, moisten it again before planting. Check your seed packet for exact spacing and planting depth instructions, or follow these guidelines:
 - Shared tray, one variety: Scatter the seeds loosely and evenly across the tray.
 - Shared tray, multiple varieties: Scratch shallow rows 1–2 inches (2.5–5cm) apart with a clean ruler. Drop seeds of each variety into a separate row. Label each row.
 - Separate pots or plug trays: Plant one large seed (e.g. cucumber or melon seed) or two small seeds (e.g. most flower seeds) in each container.
 - **Warmth needed:** Germinating seeds need daytime temperatures between 65 and 75°F (18–24°C), and night temperatures no lower than 55°F (13°C). Place the trays in a warm location near a heat source, on top of a refrigerator, or use a seedling heat mat.
 - **Water needed:** Check your seed trays daily for germination, mist with water if the soil surface has dried out, and wait for seeds to emerge from the soil. Check moisture levels every day or two. If the mix looks dry, place the container in a container of water. The mix will absorb water from the base of the container. This is less risky than watering from above, which can wash away the seeds or overwater them.
 - **Light needed:** Once the seeds sprout, remove the humidity dome and place the trays under lights. Keep grow lights within 4-inches of the tops of seedlings. Most seeds germinate (sprout) within a couple weeks. Once sprouts have emerged from the soil, take off the plastic cover (if you were using one). If you planted in rows in a shared tray, cut strips of plastic or cloth to cover the rows that have not yet sprouted.
- **Step 5: Keep soil moist but not soggy:**
 - Use a mister or turkey baster to water the young plants when needed. The goal is to keep the soil moist but not soggy. Too much water will encourage mold.
 - As the seedlings grow and the roots begin to grow into the soil, **water the plants from underneath** by adding water to the leak proof tray or setting the containers in a tray of water so the roots can draw in moisture. Don't allow the soil to become waterlogged or the seedlings will drown.
 - Once the seedlings become established, **let the soil dry slightly between watering**. Seeds will quickly die if allowed to dry out too much in mid-germination. Check at least once a day.
 - Place a grow light 6 inches (15 cm) above the seedlings and turn it on for 14–16 hours a day. Move the lamp farther away as the seedlings grow to avoid burning them. Rotate the plants daily. Plants grow toward the light. If light only comes from one window, the seedlings will lean into it and grow long, weak stems. Give the containers a quarter turn each day to promote even growth
 - Prevent fungus infection in young seedlings, called "damping off." Use sterile potting mix and clean all containers and tools with a 1:9 ratio of household bleach and water. Sprinkle dry vermiculite or perlite over the surface of the container after planting. Avoid cool, damp conditions. If the soil drips water when you squeeze it, it is too wet.

- **Step 6: Begin fertilizing the seedlings once true leaves sprout:**

- Most seed starting mixes do not contain any nutrients. When seeds first sprout, they are able to acquire nutrients from the seed's endosperm. Once the second set of leaves form, also referred to the plants' **first "true leaves"** it is time to begin fertilizing your seedlings. Begin a fertilizing regimen using **quarter-strength, organic liquid fertilizer**. Each brand is different; follow the instructions on the label for best results.
- The first set of leaves that appear are known as the seed leaves or cotyledons. The second set of leaves are the first 'true leaves,' and a sign that your plant is getting mature and ready for serious growth. Dilute a balanced fertilizer to $\frac{1}{4}$ the strength recommended on the label. Pour it into a tub and place the container in the diluted fertilizer to **absorb it from below**. **Repeat once a week** or as directed by the fertilizer label.
- If the seeds were planted in a mix that contained compost, do not fertilize them. Too many nutrients can cause "burns" or other problems.

- **Step 7: Thin the plants so the strongest survive:**

- Each container should have only one seedling in order for it to grow strong and healthy. Thinning involves selecting the strongest plant and removing the extras. The easiest way to do this and with the least amount of root disturbance is to **snip the unwanted seedlings** at the soil line. You can also try to transplant the extras into separate pots, but you risk damaging the roots and stunting growth.

- **Step 8: Pot up the seedlings to larger containers:**

- Some seedlings will outgrow their pots before it is time to transplant them outdoors. These plants will require larger containers, so they can continue to grow at a healthy pace. Once the roots fill the container, or you find that you need to water the plants constantly, it is time to repot the transplants into larger containers. I recommend 12-oz biodegradable paper cups (for overwintering, plastic cups are more durable). Recycled containers are fine, but they should be very clean. If re-using potting containers, sterilize first by soaking in a 9:1 water -bleach solution for 10 minutes, then wash.
- Water the seedlings well before transplanting. This will help contain the soil around the roots and reduce transplant shock. Use a good quality organic potting mix and pre-moisten before filling your containers just as you did with the seed starting mix above.
- Fill your containers part way with the moistened potting mix leaving enough room for the seedling's root ball to sit about 1/2-inch below the rim of the new container. (Exception: If you are transplanting tomatoes, try to bury as much of the stem as you can. Unlike other plants, tomatoes will grow extra roots along the portion of the stem below the soil.).
- Remove the seedling gently from its original container by squeezing the sides of the container and inverting it while holding your hand over the soil so the base of the plant is between the index and middle fingers. Tap the bottom of the container several times and the root ball should slide out of the container. Try not to mangle the roots or pull from the stem.
- Gently center the seedling the new container, fill in the sides with potting mix, and tamp it in lightly until you have filled the gaps. Be sure to leave about 1/2-inch below the rim of the new container to accommodate watering. Water the repotted transplant well, and then

allow the soil surface to dry out before watering again. Label your container and return the plant to the lighting shelf.

• **Step 9: Adapt your seedlings to outdoors:**

- **Harden off:** Several weeks before transplanting your seedlings to the garden, begin to harden off your seedlings to outdoor conditions. Hardening off is the process of adapting plants to the outside, so they can get used to sunlight, wind, rain, cool nights, and less frequent watering and fertilizing. The hardening off period allows your seedling to transition from the comfortable growing conditions under lights to the normal conditions they will experience in the garden.
- **When to start:** Start hardening off your seedlings about 2-weeks before their transplant date. Hardening off is the process of adapting plants to the outside so they can adjust to sunlight, cool nights, and less frequent watering. Watch your weather for freezing temperatures. If the days are warm enough, begin hardening off your seedlings in a sheltered location for a few hours on the first day, increase a little each day, until the seedlings are outside overnight. Sunlight is stronger than grow lights and can burn foliage if the seedlings are placed in the direct sun. Light breezes can sap your plants' moisture and cause weak stems to break. Cooler nighttime temperatures may stunt the plant's growth or even kill a seedling that is not used to it. Gradual exposure to the outside elements allows the plants to toughen up and become accustomed to being outside.
- **Increase outdoor exposure a little each day:** Increase the amount of time that the seedlings spend outside gradually to allow the plants to adjust slowly. Continue to harden off seedlings by moving the plants outside while temperatures are warm and then back inside at night when the temperature is cool. I usually add a couple of hours each day as long as the weather cooperates. Alter the shade or move the seedlings to a location that receives morning or evening sun, so they are exposed to a little more sun each day. Allow the seedlings to experience gentle breezes. Even filtered sunlight and light breezes can deplete your plants' moisture, so check on them frequently and give them enough water, so they do not wilt.
- **Leave seedlings outside overnight:** eventually, allow your plants to stay in full sun and outside as long as night temperatures do not drop below freezing. If it is going to get below freezing move the plants indoors. Resume the hardening off process once temperatures return to normal conditions.

• **Step 10: Transplant your seedlings to the garden:**

- After your seedlings are hardened off, they are ready to be transplanted into their permanent location in the garden. Prepare your garden beds ahead of time. If the weather has been dry, water the bed thoroughly the day before you plant. Choose a cloudy day with no wind and transplant in the late afternoon or evening to give your plants time to adjust without the additional challenge of the sun. Water the seedlings well after planting.

C. Get Your Seedlings Off to a Great Start:

- Pamper your newly transplanted seedlings in the beginning until they adjust to their new environment. Shade them from the hot sun and wind for the first few days and keep them well watered until the plants begin to sprout new leaves.
- Mulch the seedlings to help hold in soil moisture. Keep mulch a few inches away from the stems so it doesn't smother the plants.

Resources:

My go-to best book: *Guide to Growing and Propagating Wildflowers of the United States and Canada*, William Cullina, 2000. Houghton Mifflin Company; ISBN 0-395-96609-4

100 Easy to Grow Native Plants, Lorraine Johnson, 1999. Firefly Books; ISBN 1-552-09327-1

"How-tos" from the Lady Bird Johnson Wildflower Center <https://www.wildflower.org/learn/how-to>

- How to Grow a Native Plant Garden
- How to Prepare Seeds for Sowing <https://www.wildflower.org/learn/how-to/how-to-prepare-seeds-for-sowinghttps://www.wildflower.org/learn/guide-native-plant-gardening>
- etc!

North American Native Plant Society <http://nanps.org/other-publications/#>

- Has a seed exchange and several plant sales annually

Bustan Urban Gardening Essentials - Grow Lights <https://www.bustan.ca/home/grow-indoors/grow-lights>

- Lowest prices I could find, excellent service from this Toronto business. SunBlaster T5 6400K fluorescent kits recommended.

Wildflower Farm in Coldwater, On. - another great native seed source. Take care the species you buy are indigenous to your local area, as they have species native to areas all over southern Ontario (not all are native to the GTA). <https://www.wildflowerfarm.com>