

Seed Starting

A two-page primer

Plan Your Seeding Schedule

Seeds are started a certain number of weeks ahead of the planting-out date, based on how quickly they germinate and grow. The back of the seed package (or the internet...) will tell you the number of weeks-- usually between six and ten weeks. Although May 3 is the "official" average last frost date for Hamilton area be aware that this is the historical average. Climate change has made it very difficult to rely on historical data. Also, these dates are averages. There is still a 50% chance of frost on that date. Seven days after the average LFD the risk decreases to 25%. At 14 days the risk is down to 10%.

Choose Your Container(s)

The type of container to use depends on the size of the seed and how well the plant tolerates being transplanted. Plants that resent being disturbed, such as Lavatera, or those that grow very quickly (most large seeds) can be planted directly into 3 or 4" pots, peat pellets (sometimes called "Jiffy 7s. If you use a "flat" (a conventional tray container) or something similar, scatter the seed thinly and, when the seedlings develop their first set of "true" leaves, transplant them to larger containers. The tiniest seeds can be mixed with sand to reduce the density of the seedlings.

Prepare the Soil Mix

Use a sterile seed-starting medium, not garden soil. For most seeds the mix should be moistened before it goes into the containers. The mix should be moist enough to hold together nicely when you squeeze it into a ball, then crumble when you release it. For "no-fail" varieties such as Cosmos and Stocks it is easier to fill the plugs with seeding mix first, then wet it down. Gently tamp the mix down to get rid of the larger air pockets and use a flat edge to level the surface of the mix.

Plant the Seeds

Use the Internet, books, or the seed package for information on:

- how deep to sow the seed;
- whether it needs special pre-treatment;
- what temperature to maintain after sowing (temperatures given are the soil, not ambient air temperature);
- whether the seed needs light to germinate; and
- how long the seed will take to germinate

Tom Clothier's web site (<http://tomclothier.hort.net>) is an excellent resource, as is the Ontario Rock Garden Society's germination guide at <http://www.onrockgarden.com/>-

When you've set the seeds, be sure to mark them with the variety and the date sowed. Use a garden marker, grease pencil, or an industrial sharpie, not a pen. Now is the time to make a list of your seeds, noting their height, colour, soil and sun preferences. This will help you when it is time to plant out. Your seeds need constant and consistent warmth and humidity, so either cover your tray with the clear "lid" provided, or pop your container in a clear, clean plastic bag. Do not let the seeding mix dry out. Don't let the plastic cover touch the soil surface-- keep it propped up with marker sticks.

Bottom Heat

Providing warmth for your seed tray can be tricky, because it is the temperature of the soil, not the surrounding air, that matters. Bottom heat—a warm surface on which to rest your seed trays—is often necessary to successfully germinate many seeds. Sometimes the top of the 'fridge is a good spot. Do not use a heating pad—they are not designed to be used 24 hours a day. Plant propagators can be purchased from specialty garden stores, and online, but these are expensive. The following "light-bulbs-in-a-box" system for bottom heat is a cheap and simple solution.

The box can be wooden or sturdy cardboard about 12" x 18" x 18". Cut a few holes in each side a few inches from the bottom. These are for ventilation so the box doesn't overheat.

Now for the heat source. Use a 20 watt bulb if you can find one. Or a couple of 7-watt bulbs. Or a string of christmas lights, only enough to provide the desired level of heat.. Put an insulating, heat-proof liner on the bottom of the box, or use a "trouble light" with a metal case. The idea is to keep the bulb(s) from touching the bottom of the box. You could use an old plate or a ceramic trivet-- so long as it does not conduct heat well and it keeps the box bottom from heating up.

Now make the platform on which the seed trays rest. Try a large cookie rack or a ceramic tile. You need to ensure there is ventilation-- the top of the box must NOT be completely covered. Leave gaps for warm air to rise.

Set the seedling trays on the platform. Now measure and monitor how hot the seeding mix gets. To decrease the temperature, cut more holes, raise the platform, unscrew a few of the Christmas light bulbs, or decrease the bulb wattage. Use a meat thermometer to check the soil (not air) temperature inside the box.

For seeds that need light to germinate, get a clamp lamp (a few dollars at Canadian Tire) and use a compact fluorescent bulb—or two, depending on how many trays are underneath. Rig up the clamps so the light is a few inches from the tops of your trays.

Germination

Put the containers (bagged but vented) on the heat source. Mist the soil every day and do not allow the seeds to dry out. Watch for the little green sprouts to emerge. When most of the seeds have germinated, take them out of the plastic, remove them from the heat box, and put them under fluorescent lights—a few inches from the bulb. A sunny window will not provide enough light—your seedlings will become "leggy" as they strain upwards towards their energy source. They need at least 16 hours of light a day. As your seedlings grow, raise the lights (or lower the platform) to keep the light source a few inches from the top leaves. Keep the seeding mix moist— a pump sprayer will prevent the tiny seedlings from drowning. Water them from the bottom by putting the container into a shallow tray of water for a few minutes, or until the water has wicked to the surface. If you don't want to use chlorinated tap water boil it first or let it stand overnight to remove the chlorine.

Pricking Out

Once they have their first true leaves (the first "leaves" are cotyledons) seedlings can be carefully pricked out from the container they sprouted in, and replanted individually into small pots. Do not put a tiny seedling in a huge pot-- that will keep the roots too wet and invite rot. Use commercial potting mix or make your own: one part peat or coir; one part compost; one part vermiculite; and ½ part sharp sand or perlite. Moisten the mix, fill the pot, and open up a hole for the root using a pencil or chopstick. Turn the seedling container on its side and remove everything in a "lump". Using a toothpick gently tease out the seedlings with as much intact root as possible. If you can remove the soil around the root in a clump, do it. Try to minimize disturbance and breakage of the roots. Gently drop the root section into the hole and tamp it down, matching the original soil level. Give a little water at this point (bottom water is good) but don't swamp the seedlings.

Growing on

If the seedling stem abruptly withers and topples right at the soil line, you've got damping-off disease. Damping

off can be prevented by

- using a fan to keep the air moving around your plants
- not overwatering and keeping the surface of the planting mix dry
- watering from the bottom
- spraying with an organic anti-fungal liquid such as Chamomile tea (cool & dilute) or emulsified neem oil

Once the plants have a few true leaves it is okay to give them a very mild dose of fertilizer. Use a mild compost tea, or any organic liquid fertilizer at half strength. A feed of dilute kelp or seaweed fertilizer at this stage can help develop strong stems and stress-resistance. Be very careful, though--seedlings are easily overwhelmed with nutrients.

Keep the lights on during the day but turn them off at night, so the seedlings can cool off. Check the seed package or other resources for any special temperature requirements.

Hardening Off

Some plants can tolerate cooler outdoor temperatures fairly abruptly—check various resources to see whether the genus has any frost tolerance. Others will need a very gradual introduction to cool outdoor air, hot sun, drying winds, and temperature extremes of night and day.

A cold frame (a large glass-topped box with a lid that can be opened to regulate the air temperature) is ideal. If you don't have a cold frame (or a cool porch), bring your seedlings outside for a few hours each day (starting in the shade) and gradually increase the daily exposure. The process will take a few weeks. Hot daytime sun will scorch young seedlings, so try using a layer of cheesecloth or shade cloth or chose a spot with dappled shade. It is the wind that poses the biggest challenges for young plants as they foray outdoors, so be sure to keep the seedlings protected.

Planting Out

If your soil is healthy and biologically active, it will support the plant life you're introducing. If you need to amend, apply organic materials (compost, leaf mold, protein-based meals, minerals and rock powders, alfalfa, kelp, worm castings, etc.) at least three weeks before planting out.

Plant your seedlings according to their sun, soil, and moisture requirements. It is very important to water new transplants immediately (even if they're drought-tolerant varieties), and keep them watered regularly until they're established.

Now watch them grow. Enjoy!