

Starting seeds indoors

Spring weather can tantalize or terrify the eager gardener, especially when a promising warm morning deteriorates into a bitter windy afternoon full with the sting of freezing rain. Time to get the garden started inside!

Why bother starting your own seedlings when you can buy transplants at a nursery in May? Starting your own seeds lets you choose from many more varieties. Starting seeds at the appropriate time means they are transplanted to the garden before they outgrow containers. And, buying seed is usually less expensive than buying plants unless you only need a small number.

Timing

Some vegetables, such as lettuce and broccoli, prefer cool conditions. Starting cool season vegetables indoors means they will grow better and faster once transplanted and will be ready to harvest before the stress of summer heat. Note that some of these cool season vegetables can be transplanted outdoors before the last spring frost (see Table 1 on the next page). Heat-loving, long-season vegetables such as tomatoes, peppers, eggplant, and melon need the extra weeks of pampering indoors to produce fruits before the fall frosts. Other vegetables do not tolerate transplanting and should be seeded directly outdoors.



The back of this pepper pack reads, 'Seed should be started indoors, 8 weeks prior to transplanting'. Peppers should reach maturity about 65 days from transplanting.
© Desiree Jans, Dalhousie.

Indoor seeding is usually spread over a few weeks. Table 1 shows when to seed and transplant a number of commonly grown vegetables. First, find out the date of the last expected spring frost in your area. Then count backwards from that date to know when to sow seeds. Be sure to check seed packages for specific requirements.

Containers

Many types of containers can be used to start seeds. If using flats or other large containers, plant in rows and grow seedlings until they have one or two sets of true leaves, then transplant into individual containers for growing to the size to transplant outdoors. Seedlings may also be started in pots, old cans, cut-off milk cartons, margarine tubs, egg cartons, or other throwaways. Punch holes in the bottom to facilitate drainage. The pop-out trays found at garden centres are easy to use and re-usable.



Many items can be recycled as potting containers. Make sure that you clean them and make holes in the bottom for drainage. © Tracy Kittilsen, Dalhousie..



Trays are useful for growing seedlings until they are large enough to transplant to individual containers. © Tracy Kittilsen, Dalhousie

Peat pots are nice, especially for large seeds and for plants that are sensitive to root disturbance upon transplanting. Sow one or two large seeds directly in each peat pot. Thin to one seedling per pot. Peat pots may be planted directly in the garden, but do not allow the edges of the pot to stick out above the soil since they will act as a wick and moisture will evaporate from this exposed surface. Many gardeners prefer to remove the peat by peeling it from the root ball.



If you're reusing last year's flats and pots, it's a good idea to either dip them in boiling water for a few minutes or rinse them in a 10 percent bleach solution (1 part household bleach to nine parts water) to kill disease organisms that may be lingering.

TABLE 1: SEEDING AND TRANSPLANTING DATES FOR VEGETABLES STARTED INDOORS												
Days before or after last frost	-90 days	-80 days	-70 days	-60 days	-50 days	-40 days	-30 days	-20 days	-10 days	Last frost	+10 days	+20 days
Broccoli			S				T					
Cabbage			S				T					
Cauliflower				S				T				
Cucumber							S				T	
Eggplant				S						T*		
Leeks		S					T					
Lettuce, head				S			T					
Melon							S				T	
Onion (seed)		S					T					
Parsley		S						T				
Pepper					S						T	
Pumpkin							S			T*		
Summer squash							S			T*		
Tomato					S					T*		
Winter squash							S			T*		

S = seeding date; T = transplanting date; * = protect from frost if necessary

Growing medium

Most often seeds are started using a soilless or peat-lite mix since garden soil contains disease organisms that can be highly destructive to plants. Garden soil retains a lot of moisture in containers which is also detrimental to the seedlings.

Lightweight, soilless mixtures are typically comprised of peat, perlite and vermiculite. Coir (coconut fibre) is suitable as a substitute for the peat (sourcing is more environmentally friendly). Soilless media has been specifically formulated to allow water to freely drain while at the same time holding enough moisture through capillary action. It has been sterilized so it is free from disease organisms, insects, and weed seeds. Most formulations contain a starter amount of fertilizer and are uniform in texture, providing a good seedbed. If you make your own soilless mix without fertilizer, you will need to supplement nutrients. Once true leaves have developed, water plants with a liquid organic fertilizer like fish emulsion, at half strength.



A purchased growing medium can be both easy and economical for the beginning gardener. © Tracy Kittilsen, Dalhousie.

Another option is to use peat pellets or cubes, which are pre-formed and require no additional soil mix. The pellets or cubes are soaked until expanded and thoroughly wet, and then seeds are planted in the holes provided. After removing the fine net, the whole pellet or cube may then be planted without disturbing the roots. The only disadvantage to this method is the expense.

Sowing

First, moisten the growing medium with warm water. It should be moist but not soggy. Fill containers to within 1 cm from the rim. In pots or cells, plant two to four seeds in the center, leaving some space between larger seeds. In flats, draw shallow furrows about 4 cm (1½") apart. Scatter seeds thinly along the furrows. Small seeded vegetables should be spaced

about 1 cm (1/2") apart; medium sized about 2 cm (1") apart. Cover to the specified depth and pat to firm. Remember to make markers for each of the vegetables.



Pots should be filled to about 1 cm below the rim so that water doesn't run out. © Tracy Kittilsen, Dalhousie.

The planting medium must be kept moist but not soggy. A spray mist bottle can be used to mist the surface of the soil. If your home is dry, it may help to cover the containers with plastic wrap to maintain a steadier moisture level. Keep a close watch for damping-off, a fungus disease deadly to seedlings. Good ventilation helps prevent damping-off, as does a sprinkling of milled sphagnum moss, which contains a natural fungicide, on top of the soil.

Temperature and light

Most vegetable seeds germinate best at temperatures between 18-29°C so keep containers in a warm place for good germination. (Bottom heat is ideal.) Once seedlings start growing, they require less warmth.

The biggest challenge to starting seedlings indoors is making sure the young plants have enough light. Vegetable seedlings grown under low-light conditions are likely to be leggy and weak, and many fall over under their own weight after they are 7 to 10 cm (3-4") tall. If you do not have a southern exposure, you will probably need supplemental light. A simple fluorescent shop light with one warm-white and one cool-white bulb (or with grow lights) will do. The light should be placed 7 cm (3") above the surface of the media. Then as seedlings germinate and grow, raise the lights so they are 7 cm (3") away from the plants.



**DALHOUSIE
UNIVERSITY**

FACULTY OF AGRICULTURE

AGRICULTURE EXTENDED LEARNING GARDEN BOX

23 Sheep Hill Lane, Rm 276 | Haley Institute | Agricultural Campus | Truro, NS
Tel 902.893.6666 | dal.ca/extended-learning | extended.learning@dal.ca

Thinning and repotting

As seedlings grow, thin to the healthiest one in each pot. Thin those in rows to about 2 cm (1") apart. Scissors can be used to snip away extra plants without disturbing the roots of those you plan to keep.

If seedlings grown together in a flat become too crowded, you can repot them to their own containers. Fill new containers with growing medium, scoop the seedlings from their flat (a spoon works well), and put them into a hole deep enough to accommodate the seedling's root system. Water lightly and keep out of direct sunlight for a couple of days, until transplant shock is over.

Hardening off

Hardening off allows your pampered indoor plants to get accustomed to outdoor conditions. One week before you plan to transplant, move the seedlings to a protected outdoor location. Starting with two to three hours exposure, gradually increase their time outside. Monitor moisture carefully, as sun and wind can quickly dry soil in small containers. Bring them inside if particularly cold weather is expected.



*A small, low-cost greenhouse can provide transplants for many gardens.
© Lana Chisholm and Tracy Kittilsen, Dalhousie.*



*These seedlings are being hardened off in a protected area away from direct sun and drying winds.
© Desiree Jans, Dalhousie.*



Activity 1

Calculate indoor seeding and transplanting dates.

Find out the average date of the last spring frost in your area. The Old Farmer's Almanac Frost Chart for Canada, produced from Environment Canada weather data, is available at: <http://www.almanac.com/content/frost-chart-canada> or you can visit <http://www.veseys.com/ca/en/learn/reference/frost/canada> for frost dates at select locations. You can also check with local gardeners and plant nurseries.

Remember that these are AVERAGE dates. Be prepared to protect tender plants from unexpected cold snaps (see fact sheet on 'Frost protection'). Also, microclimates can make a big difference in individual gardens, so plan to record frost dates for your unique garden site over the coming years.

Use your last frost date to fill out the 'Indoor Seeding and Transplanting Dates worksheet' at the end of this fact sheet.

Activity 2

Mix your own growing medium.

Preparing your own growing medium is usually less expensive than buying ready mixed media. However, check prices based on the amount you will need. You may want to experiment with your own mixes and compare results.

For a sterile medium, mix 1 part perlite or vermiculite and 1 part finely milled peat moss or coir* (you may have to screen the peat moss or coir if they are not fine enough). This mix does not contain plant nutrients so you will need to feed seedlings with a liquid fertilizer as they grow.

For a non-sterile medium, mix 1 part well-decomposed compost, 1 part perlite or vermiculite and 1 part finely milled peat moss or coir.

*Natural fibre extracted from the husk of coconut.



INDOOR SEEDING AND TRANSPLANTING DATES WORKSHEET

INSTRUCTIONS: Write the date of your average last spring frost in the space above the 'Last frost' column. From there, fill in the dates before that frost, to the left of the column, each 10 days prior to the last. For example if your average last frost date is May 15, write May 15 above 'Last frost', then write May 5 above the column marked -10 days, April 25 in the next column to the left, etc. Then to the right of the 'Last frost' column, write May 25, June 6, etc.

TABLE 1: SEEDING AND TRANSPLANTING DATES FOR VEGETABLES STARTED INDOORS												
Days before or after last frost	-90 days	-80 days	-70 days	-60 days	-50 days	-40 days	-30 days	-20 days	-10 days	Last frost	+10 days	+20 days
Broccoli			S				T					
Cabbage			S				T					
Cauliflower				S				T				
Cucumber							S				T	
Eggplant				S						T*		
Leeks		S					T					
Lettuce, head				S			T					
Melon							S				T	
Onion (seed)		S					T					
Parsley		S						T				
Pepper					S						T	
Pumpkin							S			T*		
Summer squash							S			T*		
Tomato					S					T*		
Winter squash							S			T*		

S = seeding date; T = transplanting date; * = protect from frost if necessary