



Seed Starting Guide

Illustrations by Marcia Brewster

Adapted by Belluz Farms for Northern Ontario!

A Basic Guide to Starting Your Garden from Seed



Seed and Supplies AVAILABLE in Thunder Bay at:

Belluz Farms www.belluzfarms.on.ca

And online at www.superiorseasonsfoodmarket.com

BELLUZ FARMS



SLATE RIVER, ON

FRESH PRODUCE - GREENHOUSE - PICK YOUR OWN

"There are no gardening mistakes, only experiments"

~ Janet Kiburn Phillips

Why is it important to start your garden plants from seed?

There are various reasons to start one's own seed. At first glance, it is less expensive than buying nursery starts, and the quality of seedlings are in your control and also more suited to your planting schedule. But, by starting your own seedlings from seed you can have the earliest tomatoes in your neighborhood, plant lettuce all summer long, and sow broccoli for a fall harvest when it is known to produce the sweetest flavors. Another reason is the vast selection of varieties you can choose from. There are an infinite number of tomato varieties to choose which are less likely to be available in such diversity at a nursery. For example, there are very tiny current type tomatoes, rainbow fleshed slicers, black striped plums, to large pink beefsteak types. You can have funky, new, mouth-watering varieties that will impress anyone who visits your garden. The most important reason to start your garden plants by seed is the pride and satisfaction you get from nurturing tiny seeds to seedlings and then into beautiful, productive plants. There is nothing quite like that feeling of pride and resurging growth, especially as winter slowly wanes.



Planning Ahead

Seed catalogs provide a wealth of important information that can help you select the plant varieties that are best suited to your location and interests. Cold climate gardeners, for example, should look for vegetables that mature in 60-90 days rather than 100-120. If you are a beginning seed starter, begin with "easy seeds" that germinate quickly and do not require a lot of fussing over such as tomatoes, eggplants, peppers, broccoli, cabbage, cucumbers, melons, squash and pumpkins. It is very easy to get carried away when flipping through the colorful pages of delicious varieties in case of less is more. You'll be productive crops, than a lot a lot of care and don't yield you'll learn a lot and will be new varieties. Gardening is a don't want to overwhelm yourself and get discouraged.



the snowy winter. This is a true more satisfied with a few of different varieties that demand much. So, keep it simple to start, more confident each year to add fun a rewarding experience, you

Containers

Any container will do as long as it is at least 2-3" deep and has drainage holes. There are many different seed-starting containers on the market. Start simple and then test more advanced methods when you have the basics down. For small seeded herbs and Solanaceous crops (this is the Latin family name for eggplants, peppers and tomatoes) you can start your seeds in a compact flat or plug trays and then pot them up into larger ones. This is helpful because these crop types need to be started early and are usually finicky germinators that require special treatment. This special treatment will be discussed later in this handout. Cole crops (broccoli, cabbage, cauliflower, Brussels sprouts, and kohlrabi) and Cucurbits (cukes, melons, squash, pumpkins) can all be directly started in larger cell trays or individual containers.



Growing Medium (Fafard Organic Mix is available from Belluz Farms)

To provide optimum growing conditions and to avoid disease and insect problems, seeds should be started in a soilless growing medium or well known seedling mixture specifically designed for seedling development. These products should contain sphagnum moss (not peat), vermiculite, perlite and high quality compost. You never want to use garden soil, due to the high level of microbes living in the soil, these can be damaging to your young tender plants. If using a soilless medium, you will have to start fertilizing shortly after emergence or transplant into a potting mix. If using a seedling mix, you should have enough nutrients to carry you through till planting depending on the size of the container.

- *Sphagnum moss*: Dehydrated bog plant able to absorb 10-20 times its weight in water. It is used to retain water and provide texture. Also has fungus inhibiting properties.
- *Vermiculite*: A mica rock that has been heated until it expands into what looks like tiny layered cubes. It is used to retain water and provide texture for strong root growth. Contains magnesium and potassium and has a high cation exchange capacity, meaning it is able to absorb fertilizers and release them to plant roots when needed.
- *Perlite*: Crushed lava that has been heated until particles pop into small white sponge-like balls. It is used to retain water and provide good aeration. Holds 3-4 times its weight in water.
- *Sifted Compost*: Broken down food, animal and plant matter that has been naturally heated in piles to kill all pathogens. Provides beneficial nutrients and mimics soil properties. ** It is very important to use high quality compost for all seedling mixtures, most bagged compost quality is not at this level, and should only be used for direct use in the soil.**

Moisture

Germination requires consistent moisture. Keep soil moist but not soggy. Cover seeds with clear domes or you can also use a clear plastic bag until the seeds germinate. After seeds have sprouted the plastic should be removed. Check soil every day to make sure soil it's not dried out or too soggy. Too much moisture can stunt root growth and lead to disease problems. Letting the soil dry out a bit between watering helps prevent molds and fungi from growing on the soil surface.

It is best to use lukewarm, non-chlorinated water. This can be achieved by setting water out overnight to let the chlorine evaporate. Water softeners add a large amount of sodium to water that may harm your seedlings. Water should always reach the bottom of the growing container so that the plants stretch their roots and create a nice, fat root ball. You can also bottom water in a non-slotted tray or tub. Do not let plugs sit in a pool of water for a long period of time, as many bad things can happen such as root rot and overgrowth out of the plugs, fungus and/or bacteria invasion, etc.

Air and Humidity

Most seedlings prefer humidity levels between 50-70%. Higher humidity levels and poor circulation lead to fungus growth (damping off) and disease problems. Setting out pots of water

and using fans can aid in humidity circulation. Fans can also strengthen seedlings if faintly directed at them causing them to sway and produce thicker stems.

Temperature

Temperatures for optimal germination refer to soil temperatures, not air temperature. General rule...most seeds germinate well when soil temperature is at 78 degrees Fahrenheit or 25 degrees Celsius.

There are some that prefer cooler or warmer temperatures or even a fluctuation, so check your packet or catalog. Soil temperature in a drafty 65°F (18C) room will be cooler than 65°F (18C). If the soil is too cool, seeds may take longer to germinate or they may rot. To provide additional warmth, place trays or pots on top of a fridge, TV, heat mat or turn up heat till seeds start to grow. Be sure to get your seedlings in a sunny window or under lights as soon as they emerge through the soil surface. After germination most seedlings grow best if air temperature is below 75°F (24C), and soil temperature is maintained at 65-70°F. (18-21C)

Seeds have their own internal time conditions, some seeds take one day to weeks(parsley), and then some take over



clocks. Even with the right germinate(turnip), some take two a month or longer(perennial

Crop Type	Temperatures for Germination °F	Optimal °F (°C)
Cole Crops	40-100	85 (29C)
Cukes	60-105	95 (35C)
Eggplant	60-95	85 (29C)
Melon	60-100	90 (32C)
Onion	35-95	75 (24C)
Pepper	60-95	85 (29C)
Pumpkin	60-100	95 (35C)
Squash	50-95	85 (29C)

Light

Most seeds do not require light to germinate or receive enough filtered light through the soil surface. Seedlings should be placed in a South facing sunny window (12-14 hrs daylight) or under lights. Seedlings grown on a window sill may need to be supplemented with artificial light especially in the winter months. Seeds that germ and start to grow without adequate light become tall and leggy. Light intensity can be increased by surrounding trays with a wall of tin foil or a professional reflective material called Mylar. Essentially the light bounces off the wall and onto the plants.

Fertilizing *(Nature's Source liquid organic fertilizers are available at Belluz Farms)*

Because Fafard organic germinating mix has compost included you do not need to start fertilizing until plants are about 3-4 weeks old (or if you see leaves turning yellow).

If using soilless medium without compost you will need to start fertilizing as soon as seedlings develop their second set of true leaves. Baby them with half strength until they are 3-4 weeks old and then use full strength every 1-2 weeks. Since there are no nutrients in a soilless medium, fertilization is crucial. If using a sterile potting mix, fertilize at first sign of yellowing (this may be necessary).

Nature's Source 3-1-1 is an excellent fertilizer because it is an easy to mix liquid and includes calcium and micronutrients.

Fish emulsion is another great product that also contains trace elements, as well as major nutrients such as NPK (nitrogen, phosphorous, potassium). It has been noted that early fertilization with fish emulsion physically strengthens plants as well as intensifies disease resistance.

Thinning and Potting Up (Fafard Organic Planting Mix is available at Belluz Farms)

If you have more seedlings than desired in your plug or container simply pinch off the weakest seedlings till you have the desired number. With large plants, you will probably only want one plant per cell. For smaller plants, such as herbs, you may want many.

You may need to transplant your seedlings into larger pots if they become too large or crowded. Stems and roots are easier to handle when soil is dry. Most seedlings should be repotted at the same depth as they emerged or slightly deeper. The exception is tomatoes. These should be planted so just the top of the stem and leaf are above soil line. New roots will form all along the buried surface. Water well, fertilize if necessary, and return to a sunny location. Replanting into a mix containing compost like the 3 in 1 means you have a fresh source of nutrients for the plants and won't need to use other fertilizers again until you see some leaf yellowing. This mix is also "heavier" which means it holds more water so that the bigger plants won't dry down too fast requiring multiple waterings per day. However watch you don't over-water them - let the soil dry down well between each watering.

Transplanting

Once weather has warmed up you can start "hardening off" your plants by gradually exposing them to the great outdoors. Remember they have been pampered and need to be gradually introduced to outside elements. Start by reducing the amount of water and fertilizer you have been giving them. On the next day, begin putting plants out on a protected porch in full sun during the mid-morning hours, then move to shade in the afternoon and back inside at night. Increase sun and wind exposure throughout the week, keeping them out overnight at least one full night.



Try to plant seedlings on an overcast or drizzly day when wind is calm. Row cover or polyethylene coverings can also make it a smooth transition for your plants by protecting from wind and insects. Make sure roots have good soil contact and are well watered.

The number of days listed on a seed packet refers to the time between transplanting into the garden and your first harvest. It does not include the time period between germination and viable transplants.

Timing your Planting

Seeds sprout and plants grow at different rates, so timing is very important. Some seeds like celery, onions and leeks need to be started 12 weeks before transplanting, peppers 10 and tomatoes 6-8 weeks. Others like cukes and sunflowers only need 3-4 weeks. Appropriate durations should be indicated on the packet or in the catalog. Some seedlings may need to be potted up if growth is rapid. All crop types recommended for transplant generally germinate slowly or have special requirements, and therefore it is beneficial to start early and/or indoors.



The most common mistake is starting too early indoors where there isn't adequate light and air movement and seedlings end up tall ("leggy") and weak and may suffer at transplant.



Crop Type	When to start seeds in N.Ont.	Weeks to Transplant
Celery	Late March	10-12
Onions/Leeks	Late March	10-12
Peppers	Early April	8-10
Eggplants	Early April	8-10
Tomatoes	Early- Mid April	6-8
Melons	Early May	4-5
Watermelons	Late April	5-6
Cole Crops	April-early May	4-6
Cukes	Early - Mid May	3-5

Planting your Seeds

Growth medium should be thoroughly moistened before putting into trays or pots (warm water works best). Fill trays or pots with moist soil and pat soil down firmly. Check the packet or catalog for any specific germination requirements such as pre-chilling, pre-soaking, preference for light or dark, or special temperature requirements. Seeds can be scattered on the surface or directly placed in individual cells. Cover seeds about twice the thickness of the seed. General rule...very small seeds usually need light to germinate so cover lightly with soil to keep moist while allowing light to filter through. Mist with sprayer, do not use heavy droplets until seedlings are sturdy.

Direct Seeded Crops

Crops recommended to be have very rapid germination and



directly sown into soil tend to seedling development. They

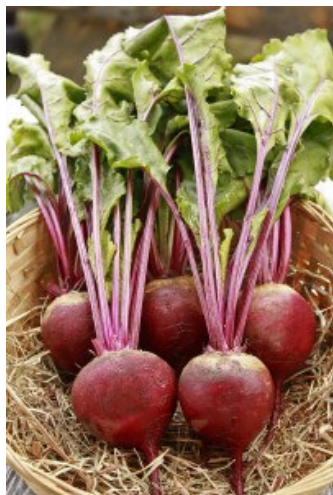
may also have cold requirements for germination, commonly called stratification. These crops generally can be sown one week before the last frost date.

Crop Type	When to direct sow seeds in VT
Beets	As soon as the soil can be worked
Carrots	As soon as the soil can be worked
Kale	As soon as the soil can be worked
Lettuce	As soon as the soil can be worked
Onions	As soon as the soil can be worked
Peas	As soon as the soil can be worked
Radishes	As soon as the soil can be worked
Spinach	As soon as the soil can be worked
Turnips	As soon as the soil can be worked
Beans	1 week before last frost date
Corn	1 week before last frost date
Cucumbers	After danger of frost has passed
Melons	After danger of frost has passed
Pumpkins	After danger of frost has passed
Squash	After danger of frost has passed
Watermelon	After danger of frost has passed



How to Choose? Open-Pollinated vs. Hybrid Varieties – By High Mowing Seeds

Posted on [February 15, 2013](#) by [Jacob Keszey](#), High Mowing Seeds



First, let's make sure we're all speaking the same language. **Open-pollinated varieties** are those, which if properly isolated from other varieties in the same plant species, will produce seed that is genetically "true to type." This means that the seed will result in a plant very similar to the parent. Beginning in the early 1900s, plant breeders worked to develop new open-pollinated varieties, using techniques to create a more pure, and thus uniform, genetic line. **Heirloom varieties** are named open-pollinated strains which either pre-date or are unaltered by the earliest open-pollinated breeding work.

If open-pollinated varieties are allowed to cross within the same species, the resulting seed will be a **hybrid**. The modern era of plant breeding started when biologists rediscovered Gregor Mendel's study of genetics. By the 1930s, many hybrid sweet corn varieties were available in the US. In commercial seed production, hybrids come from the careful and deliberate crossing of two different parent varieties, each with traits desired for the offspring. Seed from a hybrid variety can be saved, but will not be true to type.

At High Mowing Organic Seeds, we are of the opinion that both open-pollinated and hybrid varieties deserve a seat at the table. As discussed below, each has its benefits:

The Benefits of Open-Pollinated Varieties

- **Save your seed.** The most obvious benefit to using open-pollinated seeds is the option to produce one's own seed supply. Some crops, including beans, peas, tomatoes, and lettuce, are self-pollinating, and thus do not even require much isolation for seed saving. Furthermore, by selecting the best plants from which to save seed, anyone can adapt specific variety strains to their region or microclimate.
- **Less costly.** For a number of reasons, open-pollinated seeds are invariably less expensive than hybrid varieties. For every hybrid, there are actually two distinct lines of genetics that must be maintained, not to mention the careful task of production, which can get quite costly.

- **Flavor.** Few can ignore the pollinated varieties. Many creating hybrid varieties for tend to focus on qualities other ability, uniformity, and processing. Suffice it to say hybrid plant breeding, flavor *many newer breeding take flavor into great consideration when selecting and refining hybrid parent lines as well as open-pollinated varieties.*



superior flavor of many open-breeders who specialize in large-scale commercial growers than flavor, such as storage characteristics more pertinent to that since the onset of modern has not been a priority. *However, programs, including our own,*

The Benefit of Growing Hybrid Varieties

There's a reason that hybrid seeds are a part of what we still call "modern plant breeding" despite their long agricultural history. Hybrid seeds are one of the most significant advances in seed production on record. The ability to combine the best traits of separate varieties into one was widely considered the Holy Grail of plant genetics.

- **Disease Resistance.** Most importantly, hybrid seeds offer superior disease resistance. This is because, in the most basic terms, it is easier to breed disease resistance into a hybrid than into an open-pollinated seed. It goes without saying that this is desirable for home gardeners and commercial growers alike.
- **Uniformity.** Hybrid seeds offer unequalled uniformity. Commercial growers in particular desire consistency whenever produce uniform plants and uniform cultivation more efficient as well as marketing the end product.
- **Yield and vigor.** Last week Tom "hybrid vigor." This term was the 1800s to describe the increase in offspring of two parent lines of all crops demonstrate the effects of do, the benefits to the grower can be double, growth rates increase, seeds emerge more vigorously, and plants can perform better in adverse climatic conditions.



possible. Hybrid seeds
fruits. This can make
provide reliability in

mentioned the value of
coined by Charles Darwin in
overall vitality found in the
differing genetics. While not
hybrid vigor, for those that
significant. Yields can

plants can perform better in

Choose What Works for You!

We hope this furthers your knowledge and brings some clarity to the issue. Keep in mind as you shop for the coming season that we stand behind each and every variety in our catalog, whether open-pollinated or hybrid. Don't be afraid to try out a couple varieties of a crop to see the differences and chose varieties that work best for you what you need. What matters is what works for you.

High Mowing Organic Seeds available at:
Belluz Farms www.belluzfarms.on.ca
And online at www.superiorseasonsfoodmarket.com

High Mowing Organic Seeds
76 Quarry Rd. Wolcott, VT 05680