A Quick Guide to Starting Your Seeds Indoors
By Ken Kogut, St. Lawrence County Master Gardener Volunteer

Late winter can be a tough time for us gardeners. When the calendar turns to March, the days are getting longer, the snow is melting, and the itch to get outside and garden gets stronger every day. Those sunny days when temperatures soar into the 40s and 50s can seem especially cruel when followed by a sharp drop in temperatures and extended cold snaps. For many gardeners the cure for their itch to garden and for their impatience for spring to arrive is to seed vegetables and flowers indoors under grow lights for later transplant into the garden.

The benefits of starting your own seeds indoors are many. For my own gardening needs, starting my seeds indoors allows me to grow varieties that I would not find in a gardening center or box store. This is critically important when taking into consideration needs such as disease resistance and tolerance of soil type, as well as a desire to grow a variety that is not a common variety (think heirloom tomatoes). Growing your own plants also guarantees that your plants will be the optimal size when the time comes to plant them outdoors in the garden or in a container.

Successfully growing quality transplants requires good understanding of a number of parameters, so though you’re probably eager to start, take a moment to read on about these topics:

- When to start each type of seed based on knowledge of the last expected frost date for their area, to ensure transplants are of optimum maturity right when the acceptable conditions for that plant arrive
- How to use a planting calculator to help determine correct timing of your seeding
- Where in one’s home is the best location to start the seeds
- What is the proper temperature for germination
- How to provide adequate light
- What growing medium to use and when to fertilize
- How to plant each type of seed and in what type of container
- How to hardening off your transplants before transplanting them into the garden

When to start seeds: how to determine your last frost date and how to use a planting calculator
Home gardeners may think that the bigger the plant, the better it will be for transplanting. Generally this is not true. When vegetable and plant seedlings are started too early in the home, the plants can become too tall and “leggy,” and their roots can become “root-bound” in the small pots they are grown in. Oversized plants also tend to be more difficult to harden off and establish in your garden.

How do we determine the proper time to start each variety of vegetable or flower seed? The first step for the gardener is to determine their average last frost date in the spring. This is easily accomplished by going to a site such as The Old Farmer’s Almanac and typing in your zip code: almanac.com/gardening/frostdates/zipcode/. Typing in my zipcode for the Town of Potsdam gives a date of May 20th. The Garden.org website gives similar results (garden.org/apps/frost-dates/).
After this date there is a 90 percent chance that there will be no more frosts (note that there is still a 10 percent chance!). I usually select this date to plant my frost sensitive transplants into the garden, however to be safe I first check the 5 day weather forecast - no reason to roll the dice after working so hard to grow seedlings, and I am always prepared to cover transplants if a late frost is forecasted. If you live along the St. Lawrence River in Ogdensburg, Waddington, Massena, etc your last frost date will be earlier in May. If you live in Colton, Parishville or in the Adirondacks it maybe a week or two later.

Now that you know your average last frost date, it's time to plug that date into a spring garden calculator. I really like Margaret Roach’s Planting Calculator. This calculator will give you a plethora of information relating to both when a particular seed should be started indoors, and when to plant seeds directly into the garden. The calculator will also give you the proper date to transplant your new seedlings. Some frost hardy seedlings will be ready to transplant weeks before the last frost, while other sensitive seedlings will need to wait until after the last frost.

Using broccoli as an example, the planting calculator states that seeds should be started indoors 4 to 6 weeks before the last frost date and that broccoli can be transplanted into the garden 2 weeks before that date (note that broccoli can withstand a light frost). Based on my last average frost date, the calculator directs me to start my broccoli seeds between March 20th and April 3rd, and to transplant broccoli seedlings into the garden after May 1st.

Using tomatoes as a second example, the garden calculator directs me to start seeds indoors 6 to 8 weeks before the last frost date, and transplant into the garden 1 to 2 weeks after danger of frost. This means starting my tomatoes around March 27th and transplanting the seedlings into the garden around May 27th (after checking the weather forecast of course; tomatoes are very frost sensitive). Using Margaret Roach’s Planting Calculator is fun and useful, it can be found at: awaytogarden.com/when-to-start-seeds-calculator/

Where in your home you should start your seeds
Germinating your seeds will require seed starting mix, water, and warm temperatures. Once the young plants emerge from the soil, they will require light. Many gardeners will use a heat mat to ensure that their soil and seeds are held at the ideal germination temperature for a given seed type. While the heat mat will accelerate germination and perhaps give your seedlings an early boost in growth, a heat mat is probably not needed if your home is kept in the 68 to 72 degree range, a perfect temperature for germinating most seeds.

Light is critically important for growing healthy seedlings at home. Never ever try to germinate seeds on north facing window sills. The indirect light coming into the room will not be sufficient to grow your plants. Southern facing windows are better, but the length of time the sun shines on your seedlings will probably be limited and may still result in long leggy plants. Windows sills are also typically colder than the rest of the house. Plants will do best with 14 to 16 hours of direct light, something nearly impossible to get from a window location.
If you plan on regularly starting your own seeds, then you may eventually choose to invest in grow lights. There are many types of grow lights available for purchase and all should meet your needs. Cost will likely determine which type of system you choose as some can be very pricey.

I presently have two different grow light set-ups which are pictured below. The first system (left) that I have been using for years is a homemade double-shelf growing table with lighting consisting of standard 4 ft shop lights. Each light fixture takes two bulbs: a T-8 warm, and a T-8 cool fluorescent bulb. My newer system is a 4 ft two-bulb T-5 fluorescent grow light system. I built my own hanging system with 2 inch plastic PVC pipe and hung the light over a folding table. T-5 bulbs are much more intense than T-8 or T-12 bulbs. Be sure to adjust grow lights as your seedlings grow, maintaining a distance of 3 or 4” between the plant tops and the light bulbs.

(Left) Double-shelf wooden light table with T-8 fluorescent bulbs. Picture taken in mid-January with Geraniums on top level from last summer, and herbs on bottom level.

(Right) PVC light stand with T-5 grow light bulbs placed over folding table. Chains adjust the light height above the plants.

How to select a starter mix

To get the best germination and growth in your seedlings, use a light airy, growing medium called a “starter” mix. Starter mixes contain a combination of peat, compost, perlite and vermiculite. They are designed to hold moisture and provide a disease-free and insect-free growing environment. There are many options to choose from. I have had great success in the past starting my seeds using “Pro-Mix”, but have also used Miracle Grow and other brands. This year I am trying an organic starter soil mix called Fort-Vee from the Vermont Compost Company. I purchased this locally and though it is pricier, I have been told the fertility of the soil will last until transplant time.

Soil mixes labeled as “potting soil” or “raised bed soil” may be too heavy and dense to use as a starter. Likewise, never use soil from your garden as a starter. Garden soil contains bacteria, fungi, insects, and other critters that could quickly weaken, or even kill, your newly germinated seeds. With all the time
you’ll invest in starting your seeds, cutting corners to save a few dollars is a decision that isn’t likely to pay off.

**What container to Use**

Gardeners use many varieties of container to start their seeds. A quick walk through a garden center will present many commercial options ranging from peat pots in various sizes, to small pods that will expand to plantable size when watered, to the black seed trays used by commercial growers. At home, you likely have more options, like egg cartons or yogurt containers. If you choose to use an egg carton to germinate seeds, you will likely need to transplant to a larger container as the seedlings grow.

I’ve used all these gardening containers with varying degrees of success. I have found that peat containers dry out quickly and were prone to falling apart when saturated with water. Directions may say that the peat container can be planted directly into the soil and will biodegrade on its own, but at times I’ve found that the peat cube was still visible at the end of the growing season.

The expandable pods are quite amazing and work well. I did find that the roots of seedlings from one pod sometimes grow into adjacent pods and that the netting surrounding each pod wasn’t as biodegradable as advertised. The pods are small, however, and gardeners using them will have to take careful note of the planting calculator to ensure that the plants grown aren’t too large and overgrown before transplanting.

The multi-cell black or green plastic trays are my preferred method of seed starting. They are inexpensive, easy, and can be cleaned with soapy water and reused year after year. These trays also often come with a clear plastic cover for early seed starting, and a bottom tray that will allow bottom-up watering.

**How to fertilizing and water your seedlings**

Too much water and your seedlings will drown, too little water and they will dry up and wither away… watering effectively can be tricky! If your soil has algae, fungi, and a bacterial slime on its surface, then you are watering too much. If your plants are wilting and soil is pulling in from the sides of the container, the soil it is drying out. The weight of the container can give you an idea if the plants need watering or not. Check your pots each day to assess if watering is necessary.

Once your plants are placed outdoors they will need to be watered daily, or even twice a day depending on conditions until they are established (for about a week).

If your potting mix does not include fertilizer, you will need to fertilize your seedlings after the first two “true leaves” appear. (The very first leaves you see, which don’t resemble the adult leaves, are called “seed leaves”; the next set to appear are the first true leaves). You will then need to fertilize your seedlings with a soluble fertilizer at half strength twice a week or full strength once a week, following label directions. Many organic growers use seaweed/fish based fertilizers, which are effective, but can be quite smelly (trust me!) and you may want to try to find one that is labeled odor-free.

**Lastly, how to harden off your seedlings**
Hardening off is the process of acclimating your seedling to being outdoors. This is an important step to take before transplanting them into the garden. The direct sun, wind, and variable temperatures can be tough on pampered seedlings at first, potentially causing plants to sunburn and/or wind damage. Start with a few hours outdoors the first day, increasing to 6 hours the second day, then out all day. When overnight temperatures allow, leave your seedlings out for the night as well.

Presto! Your plants are ready to be transplanted.

Got a question about gardening? Send an email to SLCGrowline@gmail.com and a Master Gardener will get back to you. Best of luck this growing season!