

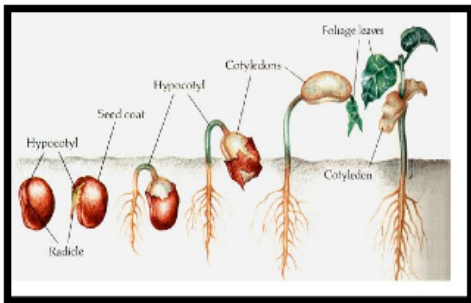
Seed Starting

Burlington Permaculture: Spring 2010

With gardening season almost upon us, now is the time to start thinking about what you want to be growing in your garden this summer, and what the needs of your seeds are. Quite a few plants, particularly in a climate like what we have in Vermont, benefit from a head start indoors. Read on for more information on the benefits of starting your own seeds, how and when to do it, along with some additional resources.

The Benefits.

To begin, although seeds can be directly sown into the ground, it is often beneficial to you as a grower to give your plants a little head start in the early spring months. Many seeds can easily be started indoors and then transplanted outside when the weather begins to warm. Some of the greatest benefits to starting your own seeds are, for one, it is less expensive than buying a pre-started plant from a nursery. Also, there are many more varieties to choose from if you start from seed and you can grow plants that will suit your planting schedule. And, as an added benefit, you will get to experience the growth of your own plants from seed to harvest.



The process of germination.

How to Start.

So, your soils have been tested, you know where you are planning to grow your plants, and you know what it is that you want to grow this summer. Now you need to know when the best time is to start sprouting your seeds, what you will start them in, and a variety of other factors such as temperature and moisture levels.

Timing is Essential.

If you're new to seed-starting it may be best to use seeds that are easy to germinate (this information can be found on the back of a seed packet or listed in a seed catalogue). Once you have selected your seeds and know their germination time, it will be to your advantage to **create a planting schedule** based on germination time, when you are planning to transplant, and when the seed packet indicates is the best time to start sprouting the seeds. Ideal times for starting range from 3-12 weeks prior to planned transplanting. If you will be growing your seedlings in a greenhouse or a very warm room, you should subtract at least a week from the recommended planting date because **heat promotes faster growth**, and you don't want to have giant plants when it's still too cold to transplant.

What to start your seeds in.

Containers.

You can start your seeds in almost any type of container as long as it is at least 2 to 3 inches deep and has some drainage holes. Depth is important because it will allow for future root growth, and drainage is necessary to avoid mold growth and over-watering. There are many different seedstarting containers on the market, including peat flats, jiffy pellets and flats with individual growing cells. For tomatoes and peppers, you may want to start your plants in small containers and then "pot up" to larger containers. Some gardeners plant their seeds in little rows in a larger flat. Once seedlings emerge, they get separated and replanted into individual containers.



Seedlings that are started very early may need to be transplanted into larger containers after three or four

weeks. This is especially true if you use flats with smaller cells rather than planting them in larger, individual growing cells. The sooner the plants are moved into individual cells with plenty of root space, the happier they will be and the better they will grow.

Growing Medium.

There are two main options for a growing medium in which to start your seeds: an organic potting soil mixed with compost, or a soilless growing medium. It is not recommended that soil from your planned garden be used.

An **organic potting soil** can easily be found at a local gardening store, and compost can easily be made at your home or bought from a store as well. This option may open up your seeds to potential infection and fungi, however the mixture will be nutrient rich and require less inputs.

A **soilless growing medium** is a moist and spongy blend of sphagnum moss, vermiculite and perlite. The finer the texture the better. You can purchase a ready-mixed blend from your local garden store, or mix your own, using 1/3 vermiculite, 1/3 perlite, 1/3 milled sphagnum moss. Soilless mixes contain few, if any, nutrients so you will need to start feeding your seedlings with a weak fertilizer solution several weeks after they germinate, and continue to feed them weekly until you transplant them into the garden. Another option is Organic Seed-

starting Mix, which is made up of sphagnum peat moss, perlite, compost, protein meal and trace minerals.

Fertilizing.

Once the seedlings develop their second set of true leaves it's time to fertilize them. Because the seedlings are delicate they will need a watered down dose of fertilizer. Ideally, use an organic fertilizer with trace elements to ensure that the seedlings receive the proper nutrients.

Seedlings: Planting and Care

There are a few preliminary steps that must be taken before planting your seeds. First, make sure that the growing medium is thoroughly moistened with warm water before filling the containers. Individual containers should be filled 1/4" to 1/2" from the top, while flat open seed trays can be filled to the top. Before sowing seeds, be sure to double check your seed packet to see if they require any special preliminary care, such as pre-chilling, pre-soaking, a preference for light or darkness, or special temperature requirements. To plant the seeds you can either scatter them over the soil surface or sow into individual cells. Do not sow thickly, this will just create too much competition and limit future growth. Most seeds should be covered with a fine layer of soil. Unless the seeds require light to germinate (such as snapdragons), or are too tiny to tolerate being covered (such as petunias), the seeds should be covered to about three times their thickness. After covering the seeds with soil, apply a fine mist of water to the soil. Be sure to label each flat/row indicating what is planted in each. Don't forget to save your seed packet for future reference.

Soil and Air Temperature.

Most plants grow best in a **soil temperature of about 78 degrees F**. Soils that are too cold will prevent proper and timely germination from occurring. To keep the soil warm, the containers can be

placed on top of any appliance that gives off heat, or in a warm and sunny room. After germinating, plants grow best in an **air temperature of about 70 degrees F**, although they can grow in temperatures as low as 50 degrees F if the soil temperature is maintained between 65-70 degrees. Too much warmth will cause the plants to grow too fast, weakening them.

Light.

Most seedlings require **14 to 16 hours of direct light** to manufacture enough food to produce healthy stems and leaves. There are two options to give your plants enough light: sunlight supplemented with artificial light, or relying on only artificial lighting.

When growing on a south-facing windowsill, you can help get more light in the window by covering a piece of cardboard with aluminum foil and placing it in back of the seedlings. The light will bounce off the foil and back onto the seedlings. If this trick is not enough and legginess (long, flimsy stems) occurs you may need to **supplement** with a few hours of artificial light during the earlier and later hours of the day, especially during the winter months. If you do not have a south-facing window, you will need to use **artificial lights**. When growing seedlings under lights, you can use a combination of cool and warm fluorescents, or full-spectrum fluorescent bulbs. The fluorescent bulbs should be placed very close to the plants—**no more than three inches away from the foliage—and should be left on 12 to 14 hours per day**..

Moisture.

Consistent moisture is essential for successful germination. The key is to **prevent sogginess**, which can lead to the rotting of seeds, or the retardation of root growth and disease problems. To help prevent molds and fungus from growing on the soil surface let the soil dry out a bit between waterings. Also, water with room temperature tap water (cold water can be a shock to seedling). If your water is chlorinated, set it out overnight so that the chlorine can dissipate.

Air and Humidity.

Most seedlings like a humidity level of **50 to 70 percent**. Higher humidity levels and poor air circulation can lead to fungus growth on the soil surface and disease problems. If the air in your house is very dry, you can keep your seedlings happy by setting them on capillary matting, or in a waterproof tray filled with small stones or a humidity grid and a little water. If your plants are in a small room, you may consider running a small fan to keep the air circulating.

Thinning and Potting.

If your plants start to get crowded, and it's too early to transplant outdoors, they may need to be transplanted into different containers. It is better to do this sooner rather than later, and when the soil is somewhat dry. Grasp the seedling by its leaves or roots (stems are too fragile to be handled), and repot at the same depth, or a little deeper. After repotting, water well, fertilize, and return the seedlings to their lighted area.

Transplanting.

When the weather begins to warm, the time has come to start "hardening off" your seedlings with gradual outdoor exposure. This will better prepare them for life in the garden. About a week before planting outside you should begin to reduce the amount of water and fertilizer you give them. Also, begin to place them outside on a porch or under a shaded tree for about an hour each day, gradually increasing their time outside. Ideally, transplanting should occur on an overcast or drizzly day with calm wind. Row cover can help to ease the transition and will protect from wind, insects and other threats. Be sure to water well and, most importantly, enjoy the experience of watching your plants grow every day!

Additional Resources

Seed Planting Schedule: <http://www.gardeners.com/When-to-Start-Your-Seeds/5215.default.pg.html>
10 Seed Starting Tips: <http://www.finegardening.com/how-to/articles/ten-seed-starting-tips.aspx>
Weekend Gardener: <http://www.chestnut-sw.com/seedhp.htm>