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## **Seed Starting Basics©**

*By Nathan Shivel*

February in Tucson is a wonderful time. Spring is just around the corner and the garden is an excellent place to be. While you can continue to direct-sow cool weather vegetable seeds such as lettuce, spinach, peas, carrots, radishes, beets, and leafy greens, you can also start seeds indoors in anticipation of warmer weather. Tomatoes are an excellent example of a crop that should be started long before outside temperatures permit.

Starting seeds indoors gives you a head start on the growing season. It also allows you to have control over the growing environment, giving delicate seedlings a better chance to become a strong plant.

### **Starting Out**

To decide when to start your particular varieties, you will want to look at the information provided on the seed packet. The packet will contain instructions for when to sow indoors. If the packet instructions are to sow seeds 4-6 weeks before last frost, you will want to determine the date of the last frost for your area. The easiest way to do this if you do not already know is to contact your local nursery. They can tell you when the average last frost occurs and you can count back from there. As an example: your local nursery tells you your average last frost date is March 15<sup>th</sup>. From there, you can look at your seed packet (let's say it tells you 4-6 weeks before last frost) and determine that you will want to start your seeds anywhere between February 8<sup>th</sup> and February 22<sup>nd</sup>. Your local nursery can also tell you which seeds are appropriate for the season. Here in Tucson, we have two growing seasons, cool and warm weather! Not everything can be planted during these very different times of year.

Besides the seeds, you will need to assemble the materials you need for seed starting. You will need containers, planting mix and a bright light source. If you have a sunroom or south-facing window, you will not need to augment the light. However, if not, you may want to invest in some artificial lighting. This can range from a simple fluorescent fixture ("Full-spectrum" tubes work

best) to commercial units with shelving racks and hanging light systems. If you are a beginner, I'd start out with a bright window and see what your needs are before investing in an expensive system.

Having established that you have enough light to get your seeds going, you will need to gather containers to plant in. You can use nursery flats (flat trays with holes for drainage and no dividers), cell flat inserts (divided packs with varying amounts of cells), peat pots, peat pellets, coir pots, or any type of container that will hold seed starting mix and allows for good drainage. If you opt to use pots that you have around the house, it is important to sterilize them to prevent the possible spreading of plant diseases or fungal organisms to your seedlings. Washing them thoroughly with hot soapy water, rinsing and then dipping them in a 5% bleach solution should do the trick. Let the pots dry and they're ready to use.

The next item you will need is a good sowing media. Potting soil is not advised for starting seeds, as it holds too much moisture. Proper seed starting mix should be soil free and sterile. We recommend purchasing a pre-packaged mix from your favorite nursery. You can make your own, but if you're just starting out it is so much easier to use a mix that you know is pest and disease free. A good mix would hold moisture but be well-draining, containing a blend of peat moss, perlite, vermiculite, sand, volcanic pumice, etc. We recommend Whitney Farms® Seed Starting Mix. To prepare the mix for seeds, you will want to moisten it thoroughly. You can put it in a wheelbarrow or bucket or any container large enough for you to add water and mix. Add water a little at a time, mixing with the seed starting mix until it is moist enough to hold together when you squeeze a bit in your hand, but not wet enough to squeeze water out of (about the same as a wrung-out sponge).

Fill the containers you intend to use for sowing with the mix, leaving about ½" from the level of the soil to the top of the container. Depending on what kind of seed you are planting, you will insert them in the mix to the proper depth. The depth will vary according to what kind of seed you are planting (the seed packet will have the recommended planting depth): for example, a small seed like basil will only need to be planted at a depth of a quarter inch, whereas a large seed such as pumpkin will need a depth of one inch.

You will want to put two or three seeds in each cell, container or segment of tray to insure you get germination. Later, if all the seeds germinate, you will want to thin out the weakest seedlings and leave the strongest ones to grow. Make sure to keep the amount of seeds to no more than two or three per area, as sowing too densely can cause disease and other problems. After sowing your seeds, sprinkle a thin layer of seed starting mix over the top and mist with water. Cover the containers with a plastic hood, plastic bag, glass bell or some other clear item to maintain humidity levels until seeds have germinated.

After sowing your seeds, it is important to clearly label the containers with the name of the seeds you have planted, also the date so you can keep track of germination times. Believe me, it is incredibly easy to lose track of what and when you have planted! Then place the containers near a bright window or under a light source (if using fluorescents or artificial lights, about three inches below the light source is appropriate). Keep plastic covered containers out of *direct* sun as they might become superheated and sterilize the seed.

Remove the clear covers for at least one hour per day to allow fresh air to circulate and to check the moisture level of the planting medium (it should be kept uniformly moist at all times). You can lightly mist the top for moisture, but if you need to water, do so from the bottom. Place the

containers in a tray or pan or tub of room temperature water (about a ½” to 1” depth) and allow to sit for a couple of hours or until the seed starting mix feels moist.

Most seeds will germinate more quickly if heated from below. While it is not absolutely necessary, it does make a difference. You can purchase rubber heat mats online at garden supply sites and many nurseries and even some hardware stores sell them as well. Seedlings germinate best at temperatures between 70° and 80° F. If you do not provide bottom heat, you should at least provide them with an area that has even temperatures in the optimum range. You would not want to put them outside in fluctuating temperatures, for example. If you have them near a window, you may want to put a newspaper over them at night to prevent cooling from drafts and nighttime temperatures.

If you have taken care to provide your seedlings with the above conditions, most seedlings should germinate between two and four weeks. This can seem like an eternity, so have patience!

### **Keep Them Growing**

When the first green shoots appear above the soil, give the seedlings all the light you can. Remove the clear covers and maintain humidity by misting once or twice daily. You can also set the containers on a layer of pebbles in trays with water. As the water evaporates, it will provide humidity to the seedlings. Again, if your soil begins to dry out, you will want to water from the bottom and remove once the soil is moist but not soggy, as you do not want the soil to become waterlogged and risk having your new seedlings rot.

Seedlings that are grown in sunny windows need to be turned daily so that all sides receive an equal amount of light, allowing the stems to grow strong and straight. Seedlings that do not receive enough light will grow thin and lanky, pale in color and with leaves too far apart. The stems will bend and stretch toward the light source and produce weak plants. The goal is thick stalks, dark-green dense leaves and an even growth pattern. If you are using artificial lighting, maintain the three inch space between the light source and the seedling. This will require you to move the light up as the seedling grows.

Never let the seedlings stand in water. Overwatering is one of the most common causes of seedling failure. Seedlings will rot or the leaves will turn yellow, and they will ultimately die. On the other hand, seedlings that do not receive enough water and are allowed to dry out will wilt, turning limp and droopy. You should be able to revive them from this state if it occurs once or twice and the wilting is not too severe, through adequate watering and light misting. However, if they suffer from drying out more than a couple of times, they will have stressed enough to permanently damage the growth cycle and may never recover.

The best temperature to keep your seedlings at once they are up is at the same as that of the environment they would grow in when mature. For example: Tomatoes, peppers and eggplant thrive in warmer temperatures, so you want to keep the environment between 60° and 75° F. Lettuce, spinach and broccoli are examples of plants that would prefer cooler temperatures, so maintain the environment between 45° and 60°F. No matter what temperature the seedlings need, good air circulation is necessary. Fresh air helps prevent damping off, powdery mildew and other fungal and bacterial ailments.

Seedlings grown in a soilless mix will need to be “potted up” once they have developed their first set of true leaves. You should use a regular potting soil for this purpose. We recommend Black Gold® potting soils. We carry both Black Gold® conventional potting soil (conventional contains

a non-organic fertilizer) and Black Gold® certified organic potting soil. Seedlings that are given their own (larger) pot will be stronger and larger. They need room to grow. You can use any kind of container you like or have handy, provided there are drain holes in the bottom to allow the water to pass through. Make sure and thoroughly moisten the soil first and fill the containers you're going to use with the moistened soil. Make a hole for the seedling in the center of each pot. Carefully separate the seedlings and slip them into the hole you have made. Pat the soil in around the seedling gently and you're ready to go. You will want to harden them off by taking them outside in a nice sunny spot on warm days for short periods of time (start with 1 hour and work your way up each day).

Seedlings that have their first set of true leaves and have been “potted up” will need regular fertilization. For the first three to four weeks, feed once a week with a liquid or water-soluble fertilizer diluted to half the regular strength recommended on the package. After the initial three to four weeks taper back and fertilize every ten days to two weeks at full strength.

At any time after they have been hardened off to the weather, you can move them to their permanent home, whether that is in containers or in the ground. Watch for sudden temperature drops, you may still want to cover tender plants on cold nights with frost cloth, especially in the case of tomatoes and peppers. We wish you much success and happy planting!