

5.2 Seed Starting Procedure [Excerpt]

As stated before, there is little information available on how to start seeds. The procedures described herein have been developed with several years of experience that have evolved into a simple system.

Preps Before Seed Starting

Set Up the Work Station

Retrieve your seed starting tools, position the potting soil next to the chair, choose the seed packets, set up a tray with the appropriate plug insert, fill a watering bottle, and have the Garden binder at hand.

Privacy

Starting seeds is tedious with very small items—the seeds. Find a time when it’s quiet without being interrupted or disturbed and work step-by-step to minimize mistakes. It’s easy to miss a plug or two.

Planning the Seed Starting

Check the Seed Schedule for which are due on about that date. Determine how many of each veggie will be started based on overall garden loading and how many trays and inserts are available. Start a few more than needed since germination is not always perfect and replacement seedlings may be needed due to pests, weather, and calamity. Update the Seed Schedule with the actual date and number.

Germination

Within categories, seeds have specific requirements to break out of dormancy. When following these basic guidelines, expect optimal germination. Ignore them and wonder why nothing is happening.

Heat – Some seeds require high temps to germinate and then lower temps to grow. Heat pads and dome covers make this possible.

Exposure to Light – When a germination guide says the seeds need darkness, this means covered with potting soil and not with a cover. If it says they need light, that means at or near the surface.

Watering – Some water helps with breaking dormancy but too much inhibits the process and changes after emerging from dormancy. Check the potting soil and don’t drown the seeds. Heating pads will evaporate some of the water but dome covers will return this to the soil. Observe and moderate.

Category	Germinate	Grow	Notes
Brassicas	75°	60°	Broccoli takes longest to germinate
Peppers	80-90°	65°	Light watering until germination
Tomatoes	75-85°	60-70°	Keep close to lights to limit premature vertical growth
Squash	85°	75°	No restrictions on watering
Melons	80-90°	75°	Do not let the soil dry out but not over watered

These are common seed-started veggies. Check the Johnny’s website for more information.

Step-by-Step Procedures

Step 1

Potting Soil into Plugs

Using the scoop, pour potting soil into the plugs one at a time working from an edge. While pouring, push the soil down until it's firm with a slight indentation in each plug.

Using a wood marker stick, swipe across the surface of the inserts making sure the potting soil is firm but not compacted. A little bit might be needed here and there. The end result should be a clean surface to clearly see each plug hole.

There will be excess. Move the filled tray to the side and swipe the potting soil into the container for a clean work surface. A marker stick makes this easy and quick.



Potting Soil into Plugs. Smooth out and pat down firm while filling.

Photo 5.2.1-1 (b)

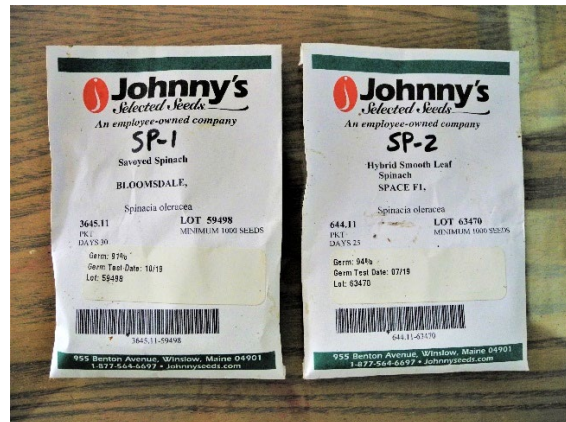
Step 2

Select Seeds

Pull out the first selection only and set the others aside. Don't get ahead—it's easy to get confused.

Keep the selection somewhat organized within the trays. This helps later since some will grow faster than others which could quickly overload the rack with partially filled plug trays fighting for space with up-planted seedlings.

Note the designation on each seed packet. This code will be annotated on seed markers sticks. Only work with one seed packet at a time.



Seed Packet Selection. Set all other seed packets aside. Avoid confusion.

Photo 5.2.1-2 (b)

Step 3

Dibble Holes

Check the seed packet carefully for information about seed depth. Using a marker stick, dibble the appropriate holes. If details are lacking, dibles about ½-inch deep are normally sufficient for most seeds. Sometimes, as with lettuce, we dibble three to five holes per plug to start multiple seedlings.

Only dibble the number of holes needed for the particular seed being started at that moment. If only starting six of a particular variety, only dibble six holes. Working left to right and top to bottom keeps the tray organized.



Dibble the Holes. Only the number of holes for one seed selection.

Photo 5.2.1-3 (b)

Step 4

Seeds into the Dispenser

Carefully open the seed packet by first testing that all seeds are in the bottom. Tap as necessary before opening to keep seeds from falling out.

Most packets are self-resealing so open carefully.

Pour just enough seeds into the dispenser plus a few more. Even though some of the seeds are smaller than the rest, this doesn't mean they're substandard. Look carefully because sometimes seed husks can look like actual seeds. Close the seed packet.

Pick what looks good to you.



Seeds into the Dispenser. Only enough to fill the dibble holes plus a few more.

Photo 5.2.1-4 (b)

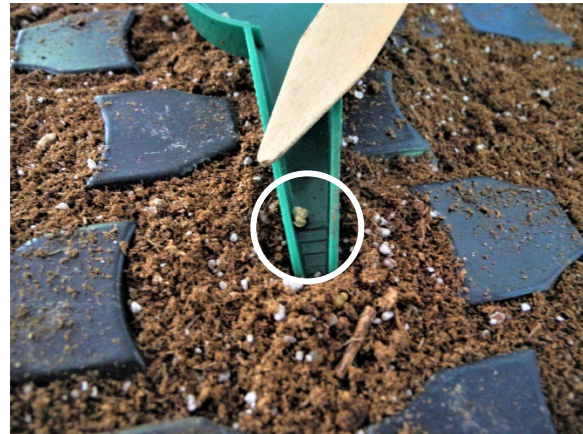
Step 5

Drop the Seeds

Do not shake out seeds one at a time as assumed by the dial with different size openings on the dispenser. Instead keep the dial top off and with your thumb blocking the chute, use a marker stick to carefully drop one seed at a time into the dibble holes.

Make sure it hits the hole. If there's a miss, try to find the seed on the surface and use the tip of the stick to shove it into the hole. If not sure, drop another. If a twin shows up later, just pull the smallest sprout.

Before continuing, drop all excess seeds back into the packet and close. Check to make sure the dispenser is clear.



Drop the Seeds. Work just one seed at a time down the chute with a stick.

Photo 5.2.1-5 (b)

Step 6

Close the Dibble Holes

After seeds have been dropped, double check that they're at the required depth. Then, gently tap down the potting soil to fill the hole.

Some seeds are large, like for squash. Gently push these down to depth with the dibble stick or your finger. In general, seeds like these should be positioned with the blunt end up.

Leave a slight indentation in the center to later act as a small water pool for the first watering.



Close the Dibble Holes. Poke seeds into holes, cover the seeds, press down the soil.

Photo 5.2.1-6 (b)

Step 7

Mark the Seedlings

Pull out the number of marker sticks needed for each plug hole that just received seeds. Place them side-by-side in front of the plug tray.

With the black marker, write the code from the seed packet.

Push each stick into the edge of each plug hole. Keeping the sticks parallel to the long edge of the tray makes watering easier.

Continue until the tray is filled with seeds and marker sticks.



Prepare marker sticks for each plug. Use the code on the seed packet.

Photo 5.2.1-7 (b)

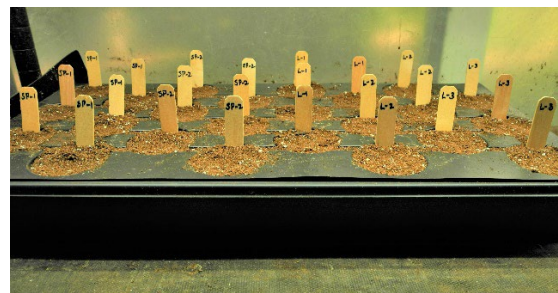
Step 8

Finish the Tray and Watering

If the potting soil is dry, the initial water tends to pool on top. It's best to do this on the seedling rack. Be liberal. All will settle down in an hour.

As soon as the first watering has soaked in, apply a second dose. It's convenient to do this after the next plug tray has been completed.

Initial watering breaks seeds out of dormancy and initiates germination.



Completed Tray of Seedlings. First watering immediately. Second watering in 20 minutes. Adjust heat. Cover over the tray.

Photo 5.2.1-8 (b)

Working with Seed Trays

Temperature

Different seedlings require different temperatures for ideal germination. Some may need 85-90°F and others 65-70°F. Monitoring and providing the appropriate temperature goes a long way toward germination. Desired temperature is both ambient, meaning the surrounding air, and within the soil itself. Use the refrigerator and cooking thermometers to monitor both. Sometimes this means opening or closing the wrap-around cover on the seedling rack, covering or uncovering particular trays, adjusting heat sources, and so on. Be diligent and recheck details for each veggie being started.

Experience: Pay Attention to Details – One year, after refreshing our memory on peppers, we went from zero germination to a full tray just by moderating temperature and water accordingly.

Heating Pads

These must have a controller to set the appropriate temperature. This will likely include a thermostat probe inserted into the potting soil. Choose a tray that's likely coolest based on its location on the rack.

The idea is to maintain temperature about 15-20 degrees above ambient room temperature. Unless indicated otherwise, start with 75 degrees on the dial and make adjustments from there. This is about as high as you should go for most seedlings. Tomatoes, peppers, melons, and squash are the exception requiring more heat. If the room is warm as spring approaches, dial down the temperature accordingly. It also may be necessary to work around temperature requirements for germination. This could mean starting all of the heat-loving seedlings at the same time. Schedule accordingly.

Adjusting the Heat – The most important first step is to get the seeds out of dormancy. This requires specific heat at the right time. Once germination is complete, the needs for seedlings change. This is when the heat should be dialed down to the outdoor ambient temperature in which they will grow. If the seedlings are warm weather, like tomatoes and peppers, keep it a bit warm. If cool weather, like cabbages and broccoli, keep it cool. Seedling trays will be moved around based on temperature.

Thermometers

Heating pads and controllers are not perfect so it's important to know what's going on in the soil for germination and then in the air for proper growth. If either of these is inadequate or outright wrong, seed starting may seem like a failure. You are growing living entities that have evolved within certain conditions—do it right.

Dial refrigerator thermometers can take abuse whereas digital types use batteries and can easily break. Commercial kitchens use the dial-type.

You'll also use the digital thermometer to test outdoor soil temperature before direct seeding. It gives fast accurate-enough readings.



Refrigerator and Digital Thermometers.

Photo 2.5.1-9 (b)

Covers / Domes

For the most part, these should only be used during germination to retain heat and moisture. During this period we use low covers and as the seedlings grow, we transition to tall covers. Both are very good to have on hand and will make your seed starting much easier. The tall covers have three vents which allows for transpiration while protecting seedlings from mice. In general, seedlings do better in dryer soil so if not needed for mice protection, take off the covers after germination.

Key for covers is to fit over the edges of the tray. This means they should be part of your overall seed starting system. About five of each size is all that you'll need.

Dark vs Light

To germinate, some seeds need darkness to germinate and others filtered light. This gets to the depth in which the seeds should be under the potting soil. If any question, check the Johnny's website for growing information. Do it right to get desired results.

Experience: Interpreting the Details – When first starting with marigold flowers, the growing information said the seeds needed darkness to germinate. We took this to heart and covered the dome with a towel in a dark room. There was only spotty germination. The intent was to simply make sure the seeds were at the correct depth under the potting soil. Another lesson learned.

Watering Schedule

In general, water twice per day, morning and evening. When watering the plugs, simply swipe up and down the rows once with a steady stream from the water bottles. Eight trays usually require two bottles of water. With heating pads and covers, once per day should suffice. Know the seed cultures—not all seedlings need the same amount of water. For instance, peppers need only barely damp soil.

Even though the top of the soil may appear dry, retained water will be working from the bottom of the tray through the plug holes to the seedlings. If a watering is missed, there should be enough retained moisture. If you're going to be gone for more than a day, find someone to help with the watering.

Adjusting the Water – After germinating with the first true leaves showing well, reduce the water to when the top of the soil is starting to dry. This stimulates rapid growth.

There will be plenty of water retained in the soil but, of course, don't let the whole plug or pot dry out completely—this would kill the seedling.

Keep checking because drying accelerates through plant transpiration when stimulated by the fan.

If seedlings wilt due to a lack of water and caught soon enough, they will likely come back quickly after getting rehydrated.



Spinach Seedlings after Reducing Water. They doubled in size in two days.

Photo 2.5.1-10 (b)

Damping Off – Too Much Water

When seedlings are overwatered, they can be killed. The stems will be weak, the top will dry out, and they'll fall over. It's too late for the seedlings to recover because they were too wet. Damping off can be mitigated by stimulating transpiration with a fan. Restart replacements and make adjustments.

Experience: Damping Off Tomatoes – We found tomatoes to be particularly susceptible to damping off as detailed in the following section. Follow those procedures for starting tomatoes successfully.

Egg Shells as Pots

Welcome to another internet-perpetrated myth. The concept is that seedlings would somehow extract calcium from the egg shells. This is completely false. Second is that egg shells are far too small to grow seedlings—there's no room for roots and those that do grow would be waterlogged.

Fertilizing Schedule

As with seeds, all potting soils are not created equal. When purchasing, some will be dry and some wet with different mixes of NPK (nitrogen phosphorous potassium) for different types of growing. To get the germination and growth desired, amendments may be required and this means fertilizing the soil.

Experience: Too Much Fertilizer – Before using sifted compost and worm castings, we used a liquid organic fish emulsion fertilizer but only for tomato seedlings. This was diluted and applied to the potting soil plugs. The first attempt was too intense with too much nitrogen—the seedlings struggled and many were replaced. After experimenting with portions of worm castings and sifted compost mixed with the peat-based potting soil, all was good and the fish fertilizer was eliminated.

Cold Stratification

This is an advanced seed starting technique that is primarily used for woody plants and certain herbs. These seeds have a hard shell to protect them from germinating prematurely such as wildflowers that go dormant in cold weather until conditions are favorable. The seeds are held at indoor temperature until the cold stratification procedure is initiated.

Which Seeds – This should normally be recommended on seed packets. If not, there is a comprehensive list at the below website.

Three Techniques – Sand and Water / Peat Moss and Water / Soaking and Paper Towels. Each is touted to work equally well and require the seeds to be cold stratified for 5-6 weeks before germinating. When weather warms up, remove the seeds from the cold and start them the same as any other seeds.

Scarification – Some of the seed shells may be very hard. To maximize germination, each seed needs to have a gentle slice across the shell to allow the seedling to emerge. This requires a very sharp thin-blade knife or a safety razor blade.

We do not have any experience with cold stratification but found excellent procedures with step-by-step instructions and photographs at the following website.

See www.americanmeadows.com/content/how-to-cold-stratify-seeds

Bottom Line

- This is when the potting soil gets tossed around. There will be a bit of negotiating on how many of which to start and when to start them based on available shelf space, potential weather, and how long it takes for various seeds to germinate under particular requirements.
- Keep your seed starting simple—work step by step in a very methodical manner. This is tedious work so expect to daydream. When interruptions occur, know exactly where you pause or plugs could easily be skipped. In general, schedule your work for when no one else is around.
- Of all the tools and material, the most important is the hand-held seed dispenser. You'll be working with very small and rolling seeds—this little tool makes it a whole lot easier. These are widely available.
- Starting tomatoes is a special case. The seedlings need proper handling and care so that they survive the process and are hardy and strong for the outside world. Take your time with tomatoes.