

# Seeding

The grow cycle starts with seeding.

Seeds come in a variety of shapes and sizes. Some seeds, like lettuce seeds, arugula seeds, and most herb seeds are pretty small. It is helpful to use tweezers to pick up tiny seeds to place into each grow plug. You may also find some seeds come pelleted. This means that there is a clay coating around the seed, making the seed easier to handle by hand.

You'll always want to plant more seeds than you will need according to the crop schedule. This is in case you miss a plug while seeding, a seedling is damaged during the seedling growth period, or the seed doesn't germinate. You can use the following equation to determine the number of seeds to plant:

Desired # Seedlings / Germination Rate = Seeds to Plant

When seeding, use good food safety practices such as cleaning the work table and washing your hands.

The seeding process takes 6 steps:

STEP 1: Fill your seedling tray with peat moss grow plugs. There are 200 cells per tray.

STEP 2: Place 1-2 seeds in each plug.

- If the germination rate of the plant you are seeding is over 80%, only plant one seed per plug. If the germination rate is less than 80%, plant two seeds per plug.
- Make sure the seeds fall to the bottom of the plug by tapping on the plug.

STEP 3: Place an empty tray on top of your newly seeded tray and press down firmly in order to compress the newly seeded plugs into their tray. This ensures that, when saturated, the plugs will remain seated securely.

STEP 4: Place the seedling tray in the seedling trough and turn the seedling pump ON. Allow the trough to fill to saturate all plugs.

- To ensure proper saturation, press into the plug. If properly saturated, water should rise up around your finger.

- The plugs should also be a dark brown almost black color when saturated.

STEP 5: Remove the tray from the seedling trough and place on the germination shelf with a humidity dome on top. The trays will remain on the shelf for about 1 week.

- Water does not get to the germination shelf, so the humidity dome is crucial to ensuring the plugs don't dry out.
- Make sure all the three vents on the humidity dome are properly sealed with tape.

STEP 6: Turn seedling pump back to AUTO once the water has *completely* drained from the trough.

### Troubleshooting

- If the plugs dry out during the one week in the germination shelf, re-saturate in the seedling trough following Step 4. Ensure that all vents on the humidity dome are sealed.
- Seeds should be stored OUTSIDE of the farm. Often, farm conditions are too humid for seed storage. The seeds should be kept in an airtight container in room temperature or in the refrigerator. If the seeds are damaged, you may find very low germination rates.

### Germination

Once seeded, the trays will remain on the germination shelf for about 1 week. Depending on the variety, your seeds may germinate in 5-14 days. This is often indicated on the seed packet, but for a rule of thumb:

- Lettuce: 5 days
- Chard & Kale: 7 days
- Arugula, Mustard Greens, Asian Greens: 5-7 days
- Herbs: 7-14 days

After germination, the trays should be moved up to the seedling trough.

At this stage, the plants have their first leaves (cotyledons). These leaves are generic of their plant type.

## Thinning Seedlings

Before the trays are moved to the seedling trough, seedlings should be thinned to one plant per plug. There are several ways to do this:

- Cut the top of the sprout off
- Pull out the extra sprouts with your hands or a tweezer

## Troubleshooting

- If your seeds don't germinate, check the germination rate on the seed pack for consistency. Make sure the seeds were not damaged or stored in improper conditions, noted above. Also ensure that one seed fell into each plug that didn't germinate.
- Make sure the plugs did not dry out over the course of the week. This could interfere with germination.

## Seedling Growth

Seedlings live in the seedling trough for 2 weeks (3 weeks total in the seedling area, including germination).

The seedlings will grow their second set of leaves, or true leaves, that will take the characteristics of the specific plant variety. This will happen during the first week in the seedling trough (two weeks from seed).

Over the course of the second week in the seedling trough (3 weeks from seed), the seedling will grow strong enough to withstand transplanting. You will start to see more root development as the roots begin to spiral around the base of the plug.

## Characteristics of healthy root formation\*:

- White roots, not brown in color
- Roots are not slimy

*\*If you are noticing poor root growth, this could be an indicator of type of root rot. Please refer to the [Pest & Disease Guide] (<https://freightfarms.zendesk.com/hc/en-us/articles/217677448-Pest-and-Disease-Best-Management-Practices>).*

### Troubleshooting:

- Seedling leaves are turning yellow: this could be an indicator that your seedlings are not getting the right nutrients.
  - Make sure your EC is set to 700 EC and both Nutrient A and B are equally dosing
  - Make sure you are using good quality source water
  - Check the pH of the seedlings. It should be between 5.8-6.2.
- Slow growth: This can be an indicator of either stunted growth or it could be the nature of the crop you are planting.
  - Stunted growth can be caused by trauma at previous stages of the plants life (unbalanced EC and pH, exposure to varying temperatures and humidit).
  - Stunted growth can also be a symptom of root rot; check the health of the roots.
  - Some varieties of lettuce grow slower than others; usually your herbs, kale, and swiss chard may look smaller than your lettuce seedlings.