Paperpot Transplanter Instruction Manual

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ADVANTAGES OF THE PAPERPOT TRANSPLANTER

The Paperpot Transplanter is part of a specialized system that drastically reduces labor. It was originally developed for sugar beet production in Japan, but it is well-suited for production of onions, leeks, shallots, lettuce, herbs, flowers and more. The Paperpot Transplanter allows you to:

- Transplant 264 seedlings in less than a minute.
- Reduce root disturbance and successfully transplant crops that do not typically transplant well.
- Start crops indoors, creating optimal conditions for germination and eliminating several weeks of weed management in the field.



Planting greens at our Tools Trial Garden in USDA zone 5b.

In addition to the transplanter itself, the following accessories are **required** to complete the Paperpot Transplanting System, and **are sold separately:**

- Paperpot Seedling Trays
- Spreader Bars and Frame
- Paper Chain Pots – 3 sizes available

The following accessories are optional, but increase efficiency:

- Paperpot Dibble Board
- Paperpot Seeders – Available in various hole sizes to accommodate multiple types of seed. The source supplier offers both gravity-fed and precision vacuum seeder models.

CROP SELECTION FOR PAPER CHAIN POTS

There are a couple of considerations to keep in mind when selecting crops to seed into the paper chain pots.

- **Spacing:** The Paper Chain Pots are available in 2, 4, and 6 inch spacing. Please see the chart below for lengths of each Paper Chain Pot model.

- **Cell size:** No matter the in-row spacing, the cells of the Paper Chain Pots are small — 1¼ inch x 1¼ inch. Crops that form a taproot (or are quick to become root bound) may not be suitable for the Paperpot system. Experiment with different varieties to see what works on your farm.

GROWER TIPS:

You can achieve 8” and 12” spacing by using 4” or 6” Chain Pots and sowing seeds in every other cell. Use painter’s tape to cover the rows of holes in the pattern shown below for correct spacing. This is great for many flower, herb, and veggie crops that need more room between plants.



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			Recommended crops		
In-row Spacing	**# of cells/tray**	**Approximate length**	**Vegetables**	**Herbs**	**Flowers**
2 inches	264	44 feet	Asian greens (baby), bunching onions, lettuce mix (baby), peas, beans, spinach (baby), radish, turnips (small), shallots	Cilantro, dill	
4 inches	264	88 feet	Asian greens, beets, onions, Swiss chard, spinach, shallots, turnips (large), kohlrabi	Basil, cilantro, dill, leaf fennel	Cut-flower basil, sweet peas
6 inches	264	132 feet	Small head lettuce, leeks, onions	Basil, chives, parsley, shiso, anise hyssop	Cut-flower basil, calendula, dianthus, snapdragon, stock, celosia, sunflowers

Note: The crops listed above are only a guideline. Your production system may use spacings that are different than the recommendations here. As with any tool, the more you use the Paperpot Transplanter, the more readily you will be able to adjust for your specific needs. Look for more recommendations in our online Grower's Library as we conduct more trials in our Tools Trial Garden.

SEEDING THE PAPERPOT TRAYS



You will need:

1. **Paperpot Seedling Trays**: The foundation of the Paperpot system is the trays. These trays are slightly larger than traditional seedling trays. Instead, they are the standard European size tray, 11¾ inches x 23 ½ inches x 1¼ inches. Made of perforated plastic, the trays have a long lifespan and can be reused for many seasons.



2. **Paper Chain Pots**: The Paper Chain Pots come in a compressed form, and are offered in 2, 4, and 6 inch spacings. No matter the spacing, each has 264 cells and will fit into the seedling trays; the only difference is the amount of paper that connects each cell to the next. All models of Paper Chain Pots appear identical to one another in the tray and can be seeded using the same seeders.



3. **Spreader Bars and Frame**: The spreader bars and frame are used to stretch out the paper chain pots and hold them open while you fill them with growing media. Once familiar with the process of expanding and filling trays, you'll find it goes almost as quickly as filling a traditional plastic tray with potting mix.
   Note: The spreader bars shown are slightly different than those that we currently carry.

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PREPARING AND SEEDING THE TRAYS

Start with Paper Chain Pots that match the desired spacing of the crop you intend to sow. If you find you need to easily identify the spacing of the paper chain pots prior to spreading them, look at the large, bold model numbers on the side of them and confer with the chart below.

Cell Spacing of Chain	Model Number
2 inch	CP303
4 inch	LP303-10
6 inch	LP303-15

GROWER TIPS:

Due to the small cell size and the moisture-wicking tendency of the paper pots, it is a good idea to use a planting media that retains moisture. We recommend a good compost-based mix.

An ideal potting mix also has relatively fine consistency, as lumps can clog the cells.

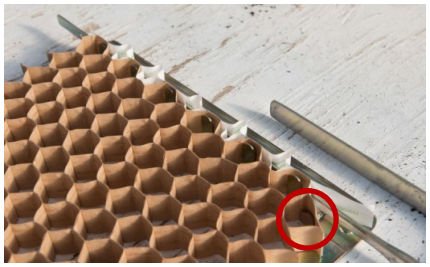


1. To begin preparing a tray for seeding, lift the flaps on either side of the Paper Chain Pot and insert the Spreader Bars into the white paper sleeves (see left).



2. Pull the Spreader Bars apart to expand the cells, revealing their honeycomb pattern (see left). Place the edges of the outermost cells over the frame, which holds the cells open while you fill it with potting mix.

Notice all but one of the retaining pegs of the frame are in a straight line; the offset peg (indicated with a circle to the left) corresponds to the last row of Chain Pots and **must be facing up** on the frame (see pictures on left) so that this first cell lines up correctly with the offset peg.



3. Place an empty Paperpot tray over the frame with expanded honeycomb cells. Flip the tray and frame over so that they are right-side-up.

4. With the frame still in place, fill the tray with an excess of pre-moistened planting media. Firmly tamp the potting mix to ensure equal compression in each cell and remove any excess media off the top of the cells.

5. You should now be able to remove the frame and cells will hold their shape, provided you have packed them with enough growing media that they will not contract. Use your fingers or a Paperpot Dibbler to make indentations in each cell. Continue seeding as you would a traditional plastic tray.







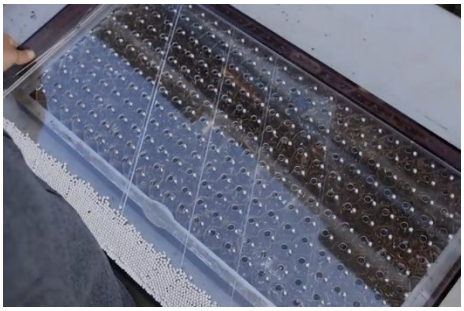
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OPTIONAL ACCESSORIES



Due to the number of small-sized cells per tray, seeding by hand can be a cumbersome process. The following optional accessories can greatly increase efficiency.

1. The **Paperpot Dibble Board** (top right) places indentations for sowing seeds in the center of each cell with one easy motion.



2. The **Paperpot Drop Seeder** (middle) allows you to seed all 264 cells in seconds. the source supplier offers 3 sized seeders for sowing different sized seeds: available in 3.2mm, 3.5mm, and 4.5mm hole sizes. The Paperpot seeder has 2 layers, each with holes drilled to match the configuration of the cells. The top layer of holes is purposefully misaligned from the bottom and is filled by adding seed to the plate and shaking it back and forth until each hole has a seed in it. The seeding plate is then placed on top of the filled tray, and the 2 layers are aligned so that the seed drops through and into all 264 cells at once.



3. The **Precision Vacuum Seeder** for Paperpot Trays (bottom right) can speed up your production even further by efficiently sowing 264 seeds at once, much like the Paperpot Drop Seeder but with more versatility. Vacuum pressure collects seeds at each open hole in the plate and drops them accurately into each cell once the suction is released. Multiple plate sizes are available for a wide variety of seed types.

GROWER TIPS:

CHECK OUT OUR WEBSITE FOR VIDEOS AND RECOMMENDATIONS FOR SEEDING AND PLANTING WITH THE PAPERPOT TRANSPLANTING SYSTEM.

SEEDLINGS



Seedlings must be transplanted at the correct size; for most crops, this is at 2-5 weeks of growth. Due to the small cell size, seedlings can outgrow this space quickly, so you should be checking your seedlings often to be sure they are within the target size range.

Check seedlings by gently lifting the paper chains from the tray to expose the roots underneath. Seedlings should have adequate time to fill out the cells, but not be so big they are growing down past the paper and becoming entangled. Experiment with your timing until you know what works well for you in your system.

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BED PREPARATION



As with precision seeders, the Paperpot Transplanter requires a well-prepared bed to be most effective when transplanting. A loose, friable soil produces the best results. Rocks, chunks of manure or compost, or stringy weed and root residues can cause the Paperpot Transplanter to operate less effectively. We recommend raking all debris from the bed, incorporating any necessary soil amendments, and smoothing out the top of the bed prior to transplanting. Bed Prep Rake and Seedbed Roller are perfect for creating an even bed for transplanting.

It can also be helpful to run a guide line (see arrow) on the bed edge to keep your rows straight. You can then line your second row up with the first, and so on across the bed.

ADJUSTMENTS



Handle Height: Adjust the handle to a comfortable, ergonomic height by pulling the cotter pin and peg from the handle neck, sliding the handle up or down to your desired height, and replacing the hardware.

Planting Depth: Set the plow depth by sliding the peg up and down the notched track towards the bottom of the handle neck (see right). Fasten in place by seating the peg in the desired notch and tightening the knob. Use the lowest setting to plant deeper, and simply raise the adjustment if you wish to plant shallower.



Sweeps: The sweeps at the rear of the transplanter can be adjusted for both height and depth (see right) to adjust the amount of soil that is packed around the newly planted seedlings. A set of press wheels are then used to smooth out the soil around the plants.

***Note*:** We recommend experimenting with the transplanter adjustments if you are unfamiliar with this tool. You will begin to figure out what settings work well in your soil, but you may need to make occasional adjustments as soil moisture and conditions change.

LOADING THE SEEDLING TRAYS



1. Carefully slide the seedling extractor plate under the seedlings on the end of the tray (see right).



2. Place the tray on the tray platform, just above the silver ramp that is attached to the Paperpot body. Slide the silver ramp between the seed extractor plate and the seedlings (see right). This will act as a ramp for your seedlings to slide over the tray lip and down towards the chute.

3. Pull seedling extractor plate out.

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TRANSPLANTING

Be sure your seedlings are well watered before transplanting or the paper chain can stick together and tear.





1. Starting with the plow just outside the bed at the end of the row, pull transplanter 1-2 ft. forward to make a furrow for the Paper Chain Pots to sit in (see right). If your furrow is not deep enough for the Paper Chain Pots to sit in, you may need to adjust the plow depth following the directions above.

2. Pull the white paper strip off the end of the Paper Chain Pots (see right) and feed the chain down the chute and into the furrow. Stake the first pot into the ground where you want your row to start to keep it from pulling out once the paper chain pots are under tension.

3. Slowly pull the transplanter forward a few feet and STOP. Take a moment to check the depth at which the Paper Chain Pots are being planted. Adjust as necessary until you find settings that are right for your soil conditions. Then continue forward down the row.

   Note: *Be sure that your Paper Chain Pots are buried so that the base of the seedlings are at (or just below) the soil surface so that the root growth will not be inhibited.*

4. Once you have reached the end of your planting area, simply tear the paper chain, pull the excess paper chain pots up and out of the way, and continue pulling forward out of the row to bury the remaining pots. If you are working in tight conditions like a greenhouse and are unable to pull forward out of the bed, you can remove the transplanter after tearing the paper and bury the last seedlings by hand.

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