INITIATIVE ON
Transforming Agrifood Systems in South Asia

Healthy crops to help sustainable, healthy diets

A guide to healthy vegetable seedling sowing in Bangladesh

Training Brief 1

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Why grow vegetable seedlings?

For the cultivation of many vegetables, growing seedlings is one the most important parts of the crop production cycle. Healthy seedlings are the first step towards growing a healthy, high value vegetable crop. Vegetables, particularly leafy greens and orange, yellow, or red colored vegetables are also very beneficial for human health. Growing seedlings can help ensure good crop establishment and reduce farm production risks by lowering the time crops are exposed to the field.

How can I grow healthy seedlings?

STEP 1. An example to calculate how much planting material and how many trays are needed.

- To know how much medium (material to sow seeds into) and how many trays into which you will sow seeds to purchase you need to calculate the number of seedlings you want to grow.
- The number of seedlings needed per bigha depends on the spacing of the crop. An example of how it can be calculated is as follows:

$$\frac{1{,}320\ (one\ bigha)}{\begin{matrix} row\ to\ row \\ distance\ (m)\end{matrix} \times \begin{matrix} plant\ to\ plant \\ distance(m)\end{matrix}}$$

- The number of trays needed to raise seedlings for one bigha can be calculated as:

$$\frac{total\ no.of\ seedlings}{no.of\ cells\ in\ a\ typical\ tray}$$

- Table 1 can help determine what inputs might be needed for mixing enough growing medium and how many trays are needed.

Table 1: An example of inputs for seedling planting medium mix to fill ~30 trays

Medium input	Amount (kg)
Cocopeat	20
Organic fertilizer (OF)	10
Diammonium phosphate (DAP)	0.75
Gypsum	0.75
Total medium	**31.50**
Amount of medium needed per tray	~1 kg
Number of trays filled from mixing the above quantities	~30
Number of cells per tray	104

An example: A farmer wants to grow half a bigha of tomato.

- The recommended plant spacing is: 60 cm (0.8 m) between rows and 80 cm (0.6 m) between plants.
- The number of seedlings needed is 1,320 / (0.6 × 0.8) = 2,750 for 1 bigha, or 1,375 for half of a bigha
- Each tray has 104 cells. The number of trays needed is 1,375 / 104 = 15 trays
- 30 trays can be filled with a mix of 20 kg cocopeat + 10 kg OF + 0.75 kg DAP + 0.75 kg Gypsum (Table 1).
- For 15 trays, prepare half the amount of mixture.

Note: It is advisable to always prepare some spare seedlings so that the weak or unhealthy ones can be discarded.

STEP2. Mixing the growing medium

- Sieve the cocopeat and wash it with water to remove impurities.
- Spread the cocopeat on a plastic sheet and mix appropriate amounts of organic fertilizer, water soaked DAP and gypsum evenly distribute these inputs throughout the medium.

STEP 3. Filling the trays and seeding

- Wet the medium lightly before it is placed into the trays to help the sown seeds get sufficient initial moisture for germination.
- Ensure that the germination trays can drain out excess water.
- Fill the trays with the partially wet medium, and sow two to four seeds per cell at a depth of 1 cm for smaller seeds such as tomato, chili, bell pepper, eggplant, cauliflower, cabbage, onion, etc. You can later thin the seedlings after germination.
- When raising seedlings for larger-seeded crops such as gourds, choose a germination tray with deep cavities. This allows for sowing the seeds deeper (2-3 cm), ensuring ample space for good root development.

STEP 4. Make sure you pay attention to seed quality and seed treatment

- Select pure, high-quality certified seed free of disease, weed seeds and insect damage.
- If the seed was not pre-treated, consider treating it with Cyantraniliprole (Fortenza 60 FS, 2.5 ml/kg of seed) 8 hours before planting to protect seedlings from cut worms or disease carrying insect pests like white flies.
- Alsop consider treating the seed with *Trichoderma* powder (6-10 g per kg of seed before sowing) to provide protection from soil-borne diseases.

STEP 5. How and where to arrange the sown trays

- Spread a thick polythene sheet in a place not exposed to direct sunlight and stack the sown trays in a zigzag manner to ensure the tray on the top doesn't press the tray below it creating an blockage for seed germination (Figure 1).
- If the weather is cool, consider covering trays with a black plastic sheet to create a warm environment for germination and prevent evaporation losses. Remove the sheet after germination starts.

Figure 1. Zigzag stacking of trays. Photo : Bharathi Parupalli.

STEP 5. Caretaking of sown trays

- Keep observing the trays for germination, which might take 2-3 days or more depending on the temperature.
- Lightly wet the trays 1-2 times per day till germination, depending on the dryness of medium and the temperature.
- Observe the trays for even and good germination (Figure 2).
- After germination, spread the trays on a raised bed covered with a thick plastic sheet.
- Add water to the vegetable nursery trays 1-2 times a day between 6 am and 6 pm until the seedlings are ready to transplant.
- Do not over-irrigate the seedlings as it might lead to fungal infestation.
- Consider adding blue or yellow sticky traps 5-10 days after germination just above the seedlings to trap insect pests.

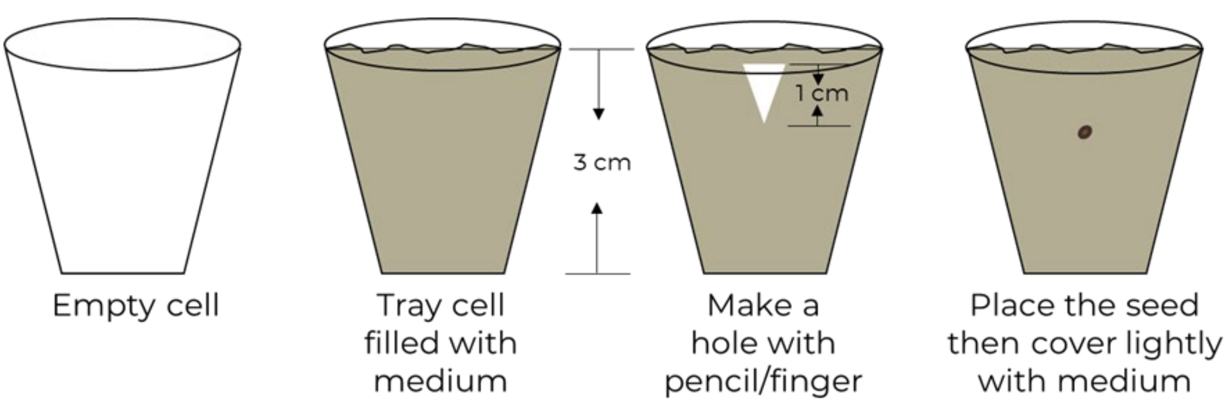
Dos and don'ts:

- Do not irrigate in the night.
- Protect the trays from excessive heat and rainfall.
- Ensure optimum sun light for the seedlings. They should not be placed under a shade or in direct sunlight.
- Keep the nursery area clean, free of weeds and water stagnation.
- Scout the seedlings regularly for pests or diseases.

Figure 2. Well-germinated vegetable seedlings growing in a tray. Photo credit: Bharathi Parupalli.

FOR MORE INFORMATION

Bharathi, PVL, Ravishankar, M., 2018. Vegetable nursery and tomato seedling management guide for south and central India. WorldVeg Publication No. 18-829. World Vegetable Center, Taiwan. 30 p.



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ABOUT TAFSSA

TAFSSA (Transforming Agrifood Systems in South Asia) is a CGIAR Regional Integrated Initiative that supports actions improving equitable access to sustainable healthy diets, that boosts farmers' livelihoods and resilience, and that conserves land, air, and water resources in a climate crisis.

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