

## Cultivating Profitable and Nutritious Tomatoes: Tips for Success in Bangladesh

A brief guide on how to grow better tomatoes

Training Brief 2

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Tomatoes (*Solanum lycopersicum*) are known for their nutritional value, boasting high levels of vitamin A, vitamin C, and antioxidants. In addition to these benefits, tomatoes can be highly profitable for farmers who have access to markets. Ensuring a successful tomato crop and maximizing yield however hinges on the quality of seedlings and season-long management practices. Whether sourced from commercial nurseries or grown on-farm, good farm management should place emphasis on seedling establishment to enhance tomato productivity. This brief provides basic advice on how to better manage tomato production in Bangladesh's unique agroecosystems.

### Climate, land, soil suitable for tomato cultivation

- High to medium-high land is preferred.
- The soil should be fertile, loamy, and well-aerated.
- Tomato thrives in temperatures ranging from 20-25°C, making it well-suited for *rabi* (winter) season cultivation, but heat-tolerant varieties can also be grown in summer with specialized crop management practices.
- Optimal soil pH is between 6.5-7.0.
- Crop duration varies depending on the variety, with up to 180 days in winter and 140 days in summer, including approximately 35 days in the nursery.
- Numerous varieties, including hybrids, have been developed by BARI and BINA since 1985, with

additional commercial hybrids available in the market.



**Above:** Tomato crop in Dinajpur district. Photo Credit: Alanuzzaman Kurishi.

**Table 1.** Growing season, name, duration, potential yield and disease resistance for most common BARI tomato varieties as well as two year-round varieties released by BINA .

Growing season	Variety name	Duration Days*	Potential yield t/ha	Potential yield kg/bigha**	Disease resistance
Winter ( <i>rabi</i> )	BARI Tomato-2	120-130	85-90	~11'500	BW
	BARI Tomato-14	140-150	~85	~11'200	BW
	BARI Tomato-21	120-150	85-90	~11'500	BW
	BARI Tomato-15	130-140	80-85	~10'800	TYLCV
	BARI Hybrid Tomato-7	120-130	90-95	~12'200	TYLCV
	BARI Tomato-16	160-180	85-90	~11'500	TYLCV
	BARI Tomato-18	120-150	70-80	~9'900	TYLCV
	BARI Tomato-20	125-155	80-85	~10'800	TYLCV
	BARI Hybrid Tomato-5	170-180	95- 100	~12'800	BW, TYLCV
	BARI Hybrid Tomato-6	170-180	90- 95	~12'200	BW, TYLCV
	BARI Tomato-17	120-130	70-75	~9'500	BW, TYLCV
	BARI Tomato-19	120-150	~66	~8'700	
Summer ( <i>kharif</i> )	BARI Hybrid Tomato-3	90-100	35-40	~5'000	HT
	BARI Hybrid Tomato-4	100	40-45	~5'600	HT
	BARI Hybrid Tomato-8	90-100	35-40	~5'000	HT
	BARI Hybrid Tomato-10	110-120	~50	~6'600	HT, TYLCV
	BARI Hybrid Tomato-11	120-130	~50	~6'600	HT
Year round	Binatomato-6	120-130	~85 ( <i>rabi</i> )	~11'200 ( <i>rabi</i> )	BW, TYLCV, EB, MS, WS
	Binatomato-7	120-130	~40 ( <i>kharif</i> )	~5'280 ( <i>kharif</i> )	

\* Duration in days including 30-35 days of seedling production. \*\* 1 bigha = 33 decimals = ~1320m<sup>2</sup>

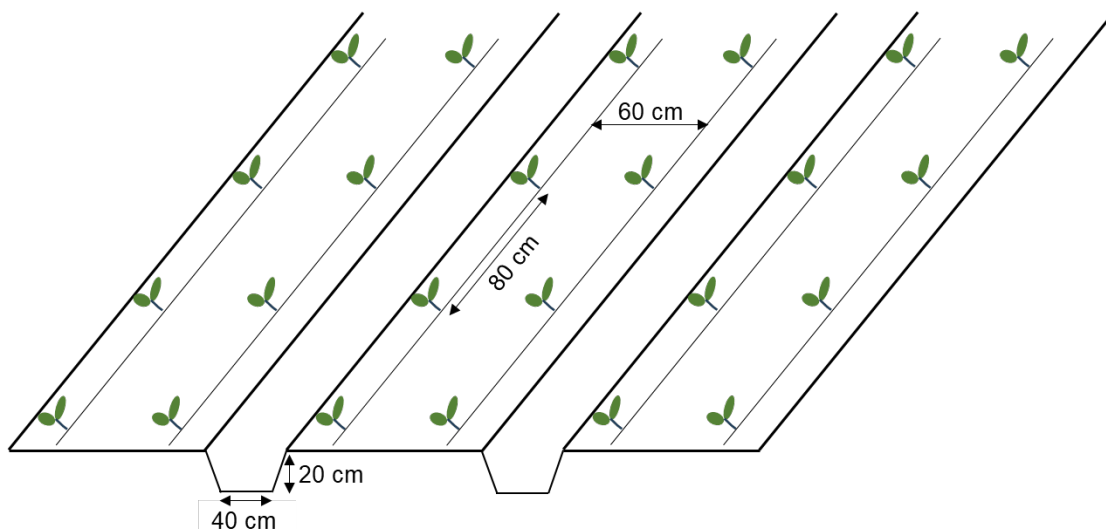
Potential yield in kg/bigha is calculated based on the average yield when a range is given for potential yield t/ha

Acronyms for diseases resistances: BW = Bacterial Wilt; TYLCV = Tomato Yellow Leaf Curl Virus; TMV = Tomato Mosaic Virus; EB = Early Blight.

Acronyms stress tolerance: HT = heat tolerance; MS = mild salinity; WS = water stress

## Crop establishment

- Farmers typically plough 3-5 times, followed by laddering.
- To aid good drainage and prevent waterlogging, raised beds, which can be established by implements drawn by two- or four-wheel tractors, are suggested.
- Beds should be 100 cm wide and 15-20 cm high, with a drainage channel of approximately 30-40 cm between each bed to remove excess water from irrigation or rainfall (Figure 1). This is especially important during the summer season, during which tomatoes may also be grown under protective cover.
- Optimal transplanting times: October-November (winter) and June-July (summer).
- Transplant in late afternoon to reduce shock to seedlings.
- Seedling age is usually 30-35 days but may vary by season..
- Recommended plant spacing is typically 60 cm row to row, 80 cm plant to plant (2,800 plants/bigha or 21,000 plants/ha).
- Narrower spacing (60 cm x 40 cm) may be appropriate for varieties that branch less.
- Transparent poly tunnels may be used during the summer rainy season, with tunnel height of 120 cm on sides and 180 cm in the middle.



**Figure 1.** Recommended plant spacing and raised beds size for tomato cultivation.

## Irrigation

### **Pre-irrigation precautions:**

- Before making beds, level the field to ensure water reaches all areas.
- Prune any lower diseased leaves to prevent disease spread.
- Stake plants to protect them and keep fruits off the ground.
- Avoid excessive irrigation during flowering to prevent flowers from dropping off plants.
- Lightly irrigate after weeding and fertilizer application. Do not irrigate before fertilizer is applied.

- Avoid late evening irrigation to reduce disease transmission.

### **Critical times to irrigate (in addition to normal irrigation timings):**

- Apply light irrigation after transplanting for 3-4 days.
- During flowering.
- During fruit development.
- After each harvest.

### **Normal irrigation:**

- Every 5-10 days depending on soil conditions, rainfall, and moisture stress.

**Table 2:** Generalized recommended fertilizer application rates for winter tomato cultivation (Ahmmed et al., 2018; Chowdhury et al., 2013).<sup>1</sup>

Fertilizer type	Total amount kg/bigha	Basal dose kg/bigha	1 <sup>st</sup> Top dressing kg/bigha	2 <sup>nd</sup> Top dressing kg/bigha	Total amount kg/ha
Manure/Compost	1,333	1,333	-	-	10,000
Urea	35	-	17.5 (50%)	17.5 (50%)	261
TSP	30	30	-	-	225
MoP	11	-	5.5	5.5	80
Gypsum	10	10	-	-	78
Zinc Sulphate	0.63	0.63	-	-	4.7
Borax	0.79	0.79	-	-	5.9

<sup>1</sup> Recommended rates may vary by location and targeted yield. Consult with the Department of Agricultural Extension for recommendations specific to your area.

**Table 3:** Recommended fertilizer application rates for summer tomato cultivation (Ahmmed et al., 2018; Azad et al., 2020).<sup>1</sup>

Fertilizer type	Total amount kg/bigha	Basal dose kg/bigha	1 <sup>st</sup> Top dressing kg/bigha	2 <sup>nd</sup> Top dressing kg/bigha	Total amount kg/ha
Manure/Compost	667	667	-	-	5,000
Urea	26	-	13 (50%)	13 (50%)	195
TSP	24	24	-	-	180
MoP	12	-	6 (50%)	6 (50%)	91
Gypsum	13	13	-	-	94
Zinc Sulphate	1.6	1.6	-	-	12
Borax	0.93	0.93	-	-	7

<sup>1</sup> Recommended rates may vary by location and targeted yield. Consult with the Department of Agricultural Extension for recommendations specific to your area.

## Nutrient management

- Refer to Table 2 for winter cultivation and Table 3 for summer cultivation generalized nutrient management recommendations.
- Basal application: Mix all manures, compost, and fertilizers except urea and MoP, then uniformly broadcast them before the final tillage pass.
- Top-dressing application: Apply all urea and MoP in two equal splits at 15 and 35 days after transplanting (DAT) and prior to light irrigation. Alternatively, use three equal splits of fertilizer, with an additional top-dressing at 50 DAT before light irrigation.

## Weeding

- The critical weed management period is the initial 30 days after transplanting. Weed frequently during this period to aid in crop establishment.
- Perform additional hand weeding at 40, and 60 DAT, or more frequently, if necessary, to maintain a weed-free field and prevent weed flowering and seed production.

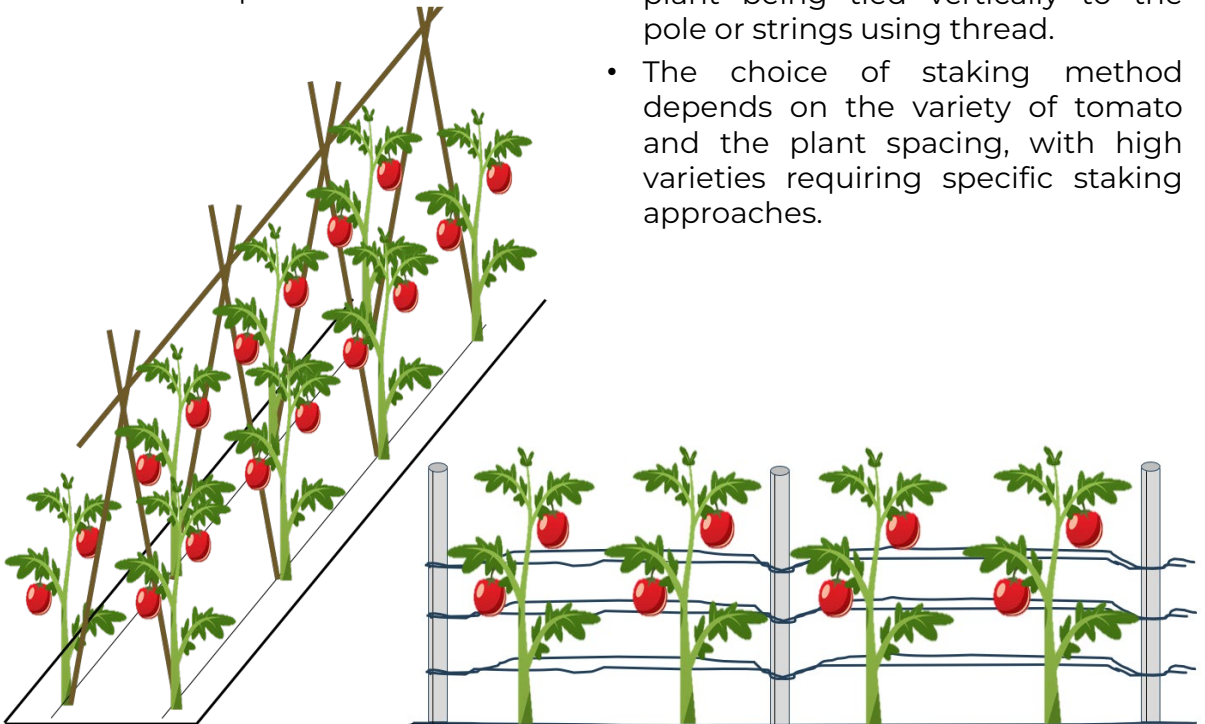
## Pests and diseases

- Tomato plants are vulnerable to pests and diseases. Integrated Pest Management (IPM) practices are recommended and will be detailed in a subsequent tomato crop management brief.
- Choose certified seeds of high quality that are free from disease, weed seeds, and insect damage.
- Utilize well-decomposed farmyard manure or compost.

- Use crop rotations by avoiding consecutive tomato planting in the same field season after season..
- Maintain a weed-free field to prevent the presence of alternative hosts for pests and diseases.
- Carefully read and adhere to the instructions provided for any pesticides, insecticides, or fungicides applied.

## Staking

- Provide structural support for tomato plants using locally available materials, such as bamboo.
- Ensure the support structure is adequately tall or wide to support the growing plants.
- Secure the structure firmly to prevent it from falling onto the plants.
- Figure 2 illustrates two potential alternatives for staking, with each plant being tied vertically to the pole or strings using thread.
- The choice of staking method depends on the variety of tomato and the plant spacing, with high varieties requiring specific staking approaches.



**Figure 2.** Two alternative methods for staking; one pole per plant forming a triangle across the rows (left). Six poles approximately every 3 m with strings between the poles (right).





## Tips for marketing tomatoes in Bangladesh

- Tomatoes can be a highly profitable crop in Bangladesh – especially so when grown in the summer– so long as farmers can successfully negotiate appropriate prices at the farm gate for their produce.
- Farmers can boost their income by harvesting summer tomatoes at least twice during the season. Harvesting four times yields a five-fold return on investment costs (Baksh et al. 2015) .
- Regardless of the season in which it is grown, and because tomato is a perishable crop, many farmers will feel a need to sell at low prices to avoid silage and waste, even if this means accepting unreasonably low prices.
- To overcome these challenges, farmers can group together and grow tomatoes at a larger scale in many fields at the same time. They can then negotiate with traders at the farm gate more effectively if they negotiate for mutually agreed on prices as a group.
- Knowledge is power: Farmers should real-time pricing and demand trends by visiting markets and having a strong idea of the difference between tomato prices paid by consumers compared to the farm gate. Farmers' groups can achieve this by regularly checking market prices and sharing this information with each other through SMS and other forms of communication.
- As a group of farmers, develop and agree upon minimum standards for the quality of tomatoes. Market these tomatoes to middlemen by emphasizing their exceptionally high quality and distinct standards, which set them apart in the market. By doing so, aim to secure better prices.

**Above top and bottom:** Farmers in Jashore, Bangladesh displaying tomatoes grown under protective covering during the summer; Summer grown tomatoes can fetch high prices in the market. . Photo Credit: Timothy J. Krupnik

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**Above:** A market vendor selling fresh vegetables including tomatoes. Photo Credit: Abdul Momin





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