



TOMATO PRODUCTION

Introduction

Tomato is a popular garden vegetable used in salads, as a vegetable, processed into tomato paste, sauce and puree. Tomato is very rich in vitamins. It belongs to the Nightshade family along with potatoes, peppers and eggplants.

Types of tomato

There are 2 types of Tomatoes – determinate and indeterminate types.

Determinate types

The determinate tomatoes, or "bush" tomatoes, grow to a height 3 - 4' and stop growing when fruit sets on the top bud. All the tomatoes from the plant ripen at approximately the same time (usually over a period of 1- 2 weeks). They are mainly grown for canning. They require a limited amount of staking for support. Examples of determinate tomato include – **Oxyl, Rambo F1, and Sandokan F1**.

Indeterminate types

Indeterminate tomatoes can grow to well over 6'. They flower, set new fruit and ripen fruits for many months. They require substantial staking for support. Examples of indeterminate tomatoes include – **Chonto F1, Bravo F1, and Mavuno F1**.

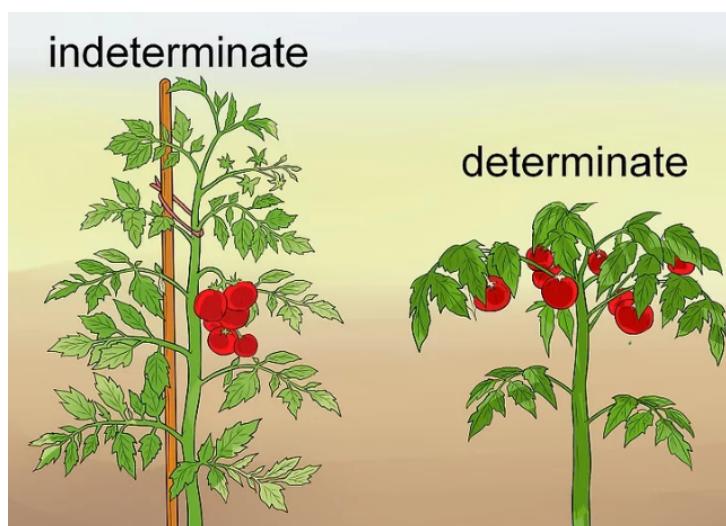


Image: [Wikihow.com](https://www.wikihow.com/Planting-and-Caring-for-Tomatoes)

Indeterminate variety keeps growing while determinate stops growing after the first harvest



Ecological requirements

Temperature

Tomato is a warm-season crop that is sensitive to frost. An average temperature of 20 -24 °C is needed for good growth & yield and high fruit quality. Fruit set and quality are poor at temperatures below 12 °C while temperatures above 35 °C with hot, dry winds cause excessive flower drop. Continuous moist, rainy weather conditions result in the occurrence and spread of foliar diseases.

Soil requirements

Tomato grows best in deep, well-drained loams. The soil should be rich in organic matter and plant nutrients, with a pH value of 6 -7.

Tomato does well under the following conditions:

- Medium rainfall range of 760 - 1300 mm though can be done under irrigation
- Optimum temperature of 20-25°C during the day and 15-17°C at night
- Well-drained light loam-fertile soils with a pH of 5-7.

Use certified tomato seeds. These are disease free and give higher yield.

Varieties preference may depend on where to grow (greenhouse or open field), target market i.e. canning or fresh market.

Growing tomatoes

Tomatoes are first started in a nursery for 3-4 weeks before transferring to the field.

Nursery establishment

Tomato is first started in a nursery. Nursery should be an area that does not flood. Make it on a level ground to avoid erosion of soil, seed & nutrients. You will need about 100g of seed/acre.

Follow the steps below to make a good nursery:



1. Select a site and a field in which a crop of tomato family e.g. potato, eggplant, pepper, tobacco had not been previously grown. Since same pests and diseases attack them, seedlings can easily be affected.
2. Make raised nursery beds 15 cm above the ground and 1 metre wide to easily reach all plants.
3. Put 1 debe of manure for every square metre of nursery bed and mix well with soil.
4. To plant make shallow furrow (about) 1cm & 15-20 cm apart across the bed and place the seeds.
5. Cover lightly with soil and put dried grass as mulch on the nursery bed
6. Spray the soil with an insecticides like Pearl 50SC and a fungicide like CONTROL 70DF to stop early pests and diseases in the nursery
7. The seeds will sprout within 8 days.
8. When seedling sprout, remove the mulch and make a shade over the bed
9. Water the seedlings 2-3 times a week.



Image: Shamba Shape Up

Make a raised bed 15cm high & have a shade



Image: Shamba Shape Up

Drench in the nursery and after transplanting

Transplanting

Transplant Tomato seedlings from the nursery when they have developed strong root & top growth. This is after 3-4 weeks after planting in the nursery & seedlings are 6-10 inches tall.



Image: Shamba Shape Up

For transplanting, select healthy seedlings 6-10 inches tall and with at least 3-4 leaves

Procedure for transplanting:



1. 6-9 days before transplanting reduce amount of watering & remove shade to harden & prepare seedlings to outdoor conditions.
2. To reduce transplant shock of seedlings, transplant seedlings in the evening or on a cloudy, cool day. Avoid transplanting in a hot, sunny, windy day.
3. When transplanting the seedlings from nursery, pull them up with a lump of soil. This will stop roots drying out & seedling with establish faster.

Planting Out

1. It is recommended to make a soil test 3-5 months before crop is planted. This will enable you to make an appropriate fertilizer management programme for good growth and high yield without wasting fertilizer. You will also detect if soil has serious diseases like Bacterial wilt.
2. If soil testing has not been done, make holes about 15cm deep, put a handful of manure & 1 bottle-top of Mavuno planting fertilizer. Plant 1 seedling/hole (with leaves 5-10cm above the soil) & firm the soil around the plant.
3. Water Tomato plants regularly, putting water at the stem (not leaves), water early in morning or later in the day but not at night. This will reduce some fungal diseases
4. Mulch the seedlings 3-5 weeks after planting (not earlier) by placing dry grass at the base of the plants. The grass will keep off weeds, stop soil from drying & also stop pests.

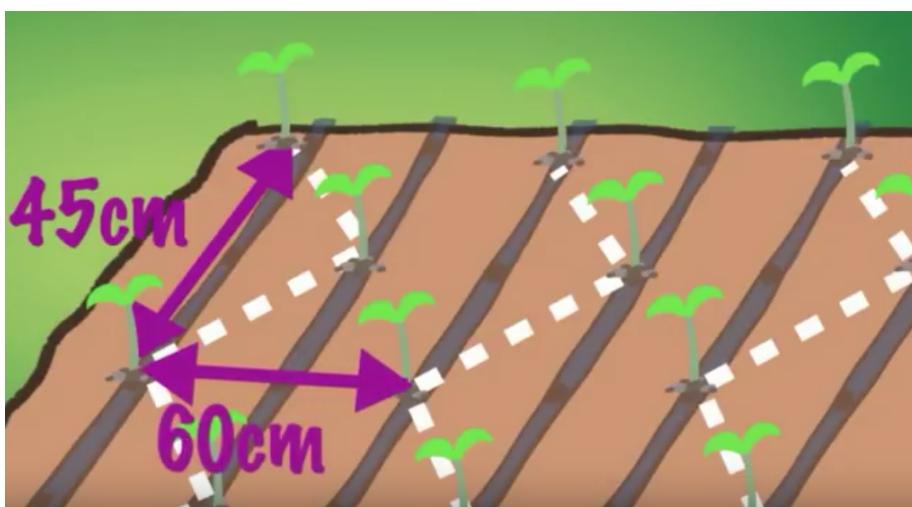


Image: Shamba Shape Up

The right spacing for transplanting tomatoes is 45cm from on plant to another on rows 60cm apart



Fertilization (Top-dressing & Foliar Feed)

1. Top-dress the plants with MAVUNO TOPDRESS 26:0:0 at 10g/plant after 3-4 weeks of transplanting. Leaf establishment in the plant uses nitrogen in the fertilizer.
2. Top-dress again with MAVUNO NPK 15:10:22 at 10g/plant when plants flower. The compound fertilizer is necessary for the supply of Nitrogen, Phosphorus and Potassium that is needed for flowering.
3. The NPK (compound) fertilizer NPK top-dress should be repeated after the first harvest.
4. In addition to NPK Tomato require other nutrients (known as micro-nutrients) in small quantities. To provide these, foliar feeds should be applied regularly.
5. During flowering & fruit setting avoid excessive Nitrogen; it leads to excess vegetative growth, poor fruit set, smaller fruits, hollow fruits and poor keeping quality.
6. Inadequate calcium can lead to Blossom-end rot disease; this disease can be corrected by applying calcium fertilizers or foliar spray such as EASYGRO Calcium.

Weeding

1. Weeds use food from the soil, space and water that Tomato crop needs. Pests stay on weeds and will jump across and cause harm to your crop. Take off the weeds often.
2. If weeds are left uncontrolled, severe infestations can reduce yield at least 50%
3. Use of mulch acts as a barrier to the growth of many weeds and at the same time conserving moisture in the soil.
4. Hand weeding is recommended both for the greenhouse and outdoor tomatoes.



Image: Shamba Shape Up

Take out weeds using a jembe to keep field weed-free. Mulching stop weeds from growing



Supporting the plant

Tomato plant is supported to allow free air movement and reduces moisture accumulation thus reducing disease incidences.

1. Tying the plant on poles and wires does the support. This is usually done early at 3-4 weeks after transplanting – to avoid plant damage.
2. Tie a string lightly on the tomato and then gently twine the string around the plant to avoid snapping the stem. Alternatively, a peg can be inserted in soil just adjacent to the tomato and a string tied on to it and then tied on the barbed wire above; the tomato is then made to wind on the string.

Staking

Staking is required to support plants once the fruiting starts especially for indeterminate types.

- It keeps vines and leaves off the ground; fruit is cleaner with less rotting.
- It makes harvesting easier.
- It makes it easier working around plants.



Image: Shamba Shape Up

Support tomato stems by staking for clean and quality fruit

How to stake

1. Use stakes (wooden, metal, bamboo cane) and push them into the soil 1-2 inches away from the main stem.
2. Loosely tie the main stem to the stake with a soft thick cord that will not cut into the stem over time.



Image: Wikihow.com

Fix stakes close to plants and tie loosely around the plant

Pruning

This is the regular removal of side shoots to remain with two healthy stems.

1. Weekly scout for side shoots before they develop into big shoots.
2. Remove side shoots, laterals, old leaves, diseased leaves & branches and overshadowed lower leaves by hand.
3. Remove flowers to 5-6 per cluster so as to get medium- large sized fruits.
4. To avoid the spread of diseases from plant to plant, do not use secateurs or a knife, 'pinch out' instead using your thumb and forefinger.
5. After formation of the first fruit cluster of mature green tomatoes remove all the lower older leaves to allow for ventilation and disperse food to the fruits.

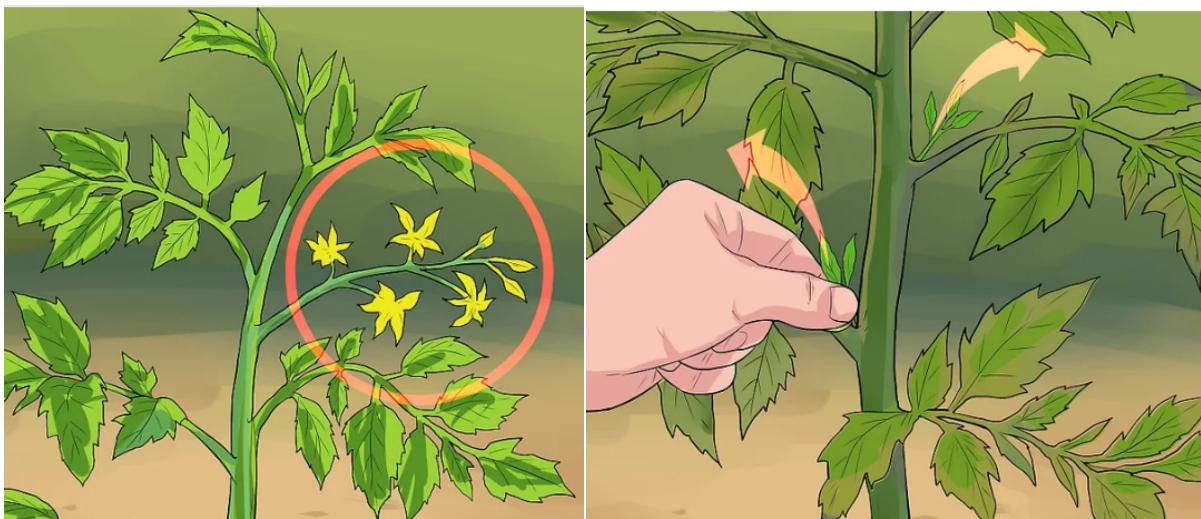


Image: Wikihow.com

When pruning, remove old leaves, excess flower clusters and side shoots

Pests and Diseases

Regularly, look out for pests & diseases in Tomato crop & control them as soon as possible.

Pests

Scouting two to three times per week, however, allowing for early detection of infestations and timely application of pest specific control measures is the most cost-effective management strategy.

The best time to look for pests is in the morning when they are on the plant before leaving to feed.



Common pests include; Aphids, thrips, whiteflies, cutworms, bollworms, leaf miners, spider mites and nematodes.

Disease

Diseases cause Tomato to have poor yield & poor quality. They are more serious in hot & humid weather.

Common diseases include: Wilts, Blight, Leaf spots and mildews.

1. For the control of pests, cultural methods are the best e.g. clean weeding, use of certified seed, destroying alternate hosts etc.
2. Do not wait till the pest or disease symptoms begin to show. Carry out preventive spraying; observe the product label recommendations in each case. For diseases e.g. mildews, blight, copper-based or sulphur-based fungicides are used.
3. Viral diseases can be controlled by controlling vectors. Key vectors include; aphids, thrips, whiteflies and nematodes