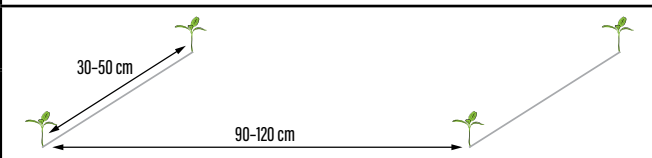


## Tomato

Preferred climactic conditions	
<b>Air temperature</b>	Between 20–27°C. Fruit setting can be poor when temperature <10°C and >30°C
<b>Soil type</b>	Well-drained sandy loams
<b>Climate conditions</b>	Warm-dry, cool nights
<b>Sun/shade tolerance</b>	Full or partial sun
<b>Drought tolerance</b>	Low
<b>Flood tolerance</b>	Low

Seed sowing and spacing	
<b>Direct seeding</b>	Plant 2–3 seeds per planting hole. Thin to one healthy seedling when plants have 4–5 leaves.
<b>Transplanting</b>	Sow one seed per seed tray cell or container. Healthy seedlings can be transferred four to six weeks after sowing or when they have 4–5 leaves. One week before transplanting, harden off seedlings by gradually increasing exposure to full sunlight.
<b>Seed depth</b>	1 cm
<b>Between-plant spacing: 30–50 cm</b>	
<b>Row spacing: 90–120 cm</b>	

### Cultivation

**Irrigation needs:** Tomatoes are highly drought sensitive and insufficient water will greatly reduce yield. Gently irrigate after sowing or transplanting to reduce seed displacement and then water one to two times daily as needed. Once tomatoes have started to flower they become very sensitive to soil moisture deficit. Adequate irrigation at this time will reduce flower drop and increase yield. It is also critical to have sufficient moisture when tomato fruits are growing. Any water stress during fruit production can lead to the development of blossom-end rot and a reduction in fruit size and yield.

**Fertilizer:** Start with a well-fertilized bed. If leaves appear yellow, apply one bottle cap of inorganic nitrogen fertilizer around the base of each plant or use a liquid foliar fertilizer.

**Special cultivation practices:** Tomato plants should be staked two to three weeks after transplanting to prevent fruit from lying on the ground and encouraging air flow throughout the foliage. Indeterminate tomato varieties should be pruned to two main stems to encourage larger fruits to develop.

### Harvesting

**When to harvest:** Tomato fruits are ready for harvesting **2–3 months** after planting.

**How to harvest:** When fruits are at the desired ripeness, pluck them off the stem gently, either with or without the cap. Avoid bruising the fruit during harvesting or transferring them out of the garden. Do not allow freshly harvested fruits to sit in the hot sun as this will accelerate spoilage.



Healthy seedlings ready for transplanting



Plants growing in raised beds with straw mulch



Staked tomato with lower leaves removed. Removing the lower leaves improves airflow, reducing humidity in the canopy.

# Tomato pests and diseases

## SOUTH AMERICAN TOMATO LEAF MINER

As larvae feed, they produce large "blotch-type" mines in leaves and can burrow in stalks and consume apical buds as well as fruits. The leaf mines later become necrotic and are potential areas for invasion by secondary pathogens. They can destroy tomato plants during all growth stages leading up to 100% losses if timely control measures are not taken.

### CONTROL

- Remove destroyed plant tissue and fruits immediately.
- Do not plant with or near other nightshades such as potatoes, eggplants, and peppers.
- Practice crop rotation with known non-hosts, such as cucumbers, beets, and sweet potatoes.



Photo credit:  
[North Central IPM Center](#)



Photo credit:  
[North Central IPM Center](#)



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[North Central IPM Center](#)



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[North Central IPM Center](#)

## TOMATO FRUIT WORM

Young larvae feed on leaves and floral buds, and older larvae feed on floral buds, flowers, and young fruits. The holes are circular and often surrounded by frass (fecal pellets). Larvae feed on the inner contents of the fruit; severely damaged fruits are not edible.

### CONTROL

- Physical removal of the fruit worms and biopesticides can reduce damage.



Photo credit:  
[Blake Layton MSU-ES](#)



Photo credit:  
[Ohio State University](#)



Photo credit:  
[Mississippi State University](#)

## ARMYWORM

The larvae of this moth are nocturnal. They actively feed at night and hide during the day. Larvae cause defoliation and they may cut seedlings or young plants at soil level.

### CONTROL

- Allow chickens to graze in gardens with mature tomato plants.
- Hand remove larvae.
- Promote natural enemies such as bigeyed bugs, minute pirate bugs, and wasps.



Photo credit:  
[Jack Kelly Clark, UC IPM Program](#)



Photo credit:  
[Ken Gray Insect Image Collection](#)



Photo credit:  
[Ken Gray Insect Image Collection](#)

## BACTERIAL WILT

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Bacterial wilt is caused by a soilborne pathogen that infects most Solanaceae crops. Mature, fruit-bearing plants are affected first by the wilting of a few leaves quickly followed by the entire plant wilting suddenly. More rapid decline is prevalent in hotter weather. Stems may have a brown discoloration. As plants die, bacterium is released back into the soil from decaying roots and stems. Bacterium can survive for long periods in the soil, even without host plants.

### CONTROL

- Remove infected plants immediately.
- Use tolerant varieties or graft tomato on tolerant rootstocks.
- Practice crop rotation and do not plant Solanaceae crops for at least three years.
- Disinfect all equipment to avoid spreading the disease to new areas.



## FUSARIUM WILT

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Fusarium wilt is a soilborne fungus that causes yellowing on one side of the plant or leaf. Yellowing begins on older, bottom leaves, followed by wilting, browning and defoliation. Fusarium fungi can survive in the soil or plant debris for up to ten years.

### CONTROL

- Plant resistant varieties labelled "VF."
- Remove infected plants from the garden and practice crop rotation. Tomato, potato, pepper, and eggplant are all hosts of fusarium wilt.



Photo credit:  
[growingproduce.com](http://growingproduce.com)



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[Seminis](#)



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[Brittanica - FLPA/age fotostock](#)

## TOMATO YELLOW LEAF CURL

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Tomato yellow leaf curl is a virus spread by whiteflies. Infected tomato plants initially are stunted and leaves of infected plants are small and curl upward. Leaves appear crumpled and have interveinal and marginal yellowing. Plants appear bushy because of shorted internodes.

### CONTROL

- Use TYLCV-resistant and -tolerant varieties.
- Use virus- and whitefly-free transplants.
- Manage whiteflies.



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[Seminis](#)



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