

Tomato Factories

The colonization of America brought about the discovery of an extraordinary variety of plants that have been used as food for a long time. An important example is the tomato, which is consumed globally. The cultivation of the tomato has reached marked levels of technological complexity that help address problems of infestation and adverse environmental conditions, as well as make it possible to grow tomatoes without using soil. ●

Traditional Cultivation

In gardens, tomato plants are grown in accordance with their annual growth cycle, using adequate soil and pest control.

Planting	End of Winter
Harvesting	Beginning of Summer

5.5 pounds (2.5 kg)

THE AVERAGE GROWER PRODUCES A PLANT CAN PRODUCE IN ONE YEAR

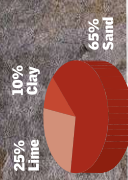
GOOD NEIGHBORS
Raising carrot and cabbage crops in the same garden adds the development of tomatoes.

FERTILIZER
provides the soil with nutrients.

IRRIGATION
Every plant requires water (2.5 gal/10 L) of water every week as it grows.

LEVEL A
Water Absorption Area
has nutrients that are essential to the plant.

LEVEL B
allows for good water drainage from rain or irrigation.



Red Spider Mite
Tetranychus turkestanii



Sweet Potato Whitefly
Bemisia tabaci



Green peach aphid
Myzus persicae



MOST COMMON INFESTATIONS



Tomato
Solanum lycopersicum

GREENHOUSE
Seedlings grow protected from frosts.

6 to 8 inches (15-20 cm)

TRANSPLANT
The seedlings are transplanted when it has three or four real leaves.

STAKES
help the plants to grow and remain upright.

NETTLES
discourage insects that destroy tomatoes.

LATE CROP
Transgenic tomatoes mature more slowly than tomatoes that have not been modified.

SALINE SOILS
Due to a shortage in rainfall in level A, and increase its salinity.



LEVEL A
High concentration of salts

LEVEL B
The clays retain water that soaks into the soil

64-77° F (18-25° C)
IS THE OPTIMAL TEMPERATURE.

More
plants per area are desired.

HIGH YIELD
The plants are folded as designed to make maximum use of the available space.



DRY CLIMATES
These climates are not appropriate for planting tomatoes that are not modified, but they can be used to grow modified crops.

DNA
Genetic material is chosen.

GENES
The genes that have the desired characteristic are isolated.



Transgenic Crop

Biotechnology is used to create plants that can be cultivated in soils which, under normal conditions, would not be adequate (for instance, soils with high salinity).

Planting	Winter
Harvesting	Summer/Autumn

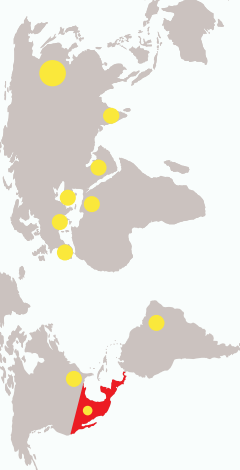
3 BACTERIAL DNA
The genes are inserted into a bacterial plasmid.

4 MULTIPLICATION
Bacteria are cultivated to replicate the altered plasmids.

5 TRANSFER
The genes are inserted into the DNA of the plant.

6 NEW FRUITS
Plants are obtained that produce tomatoes with the desired characteristic.

ORIGIN OF THE TOMATO
Indigenous to Peru, it was domesticated in Mexico and Central America.



Hydroponic Cultivation

Water and nutrients are sufficient to grow tomatoes. For this reason, it is possible to grow crops in inert substrates without any soil. This technique is very useful for obtaining tomatoes in desert areas and for making them available for harvest at any time of the year.

HYDROPONIC GREENHOUSES
allow growers to control the light, water, nutrients, and temperature of cultivation.

The water flows under the force of gravity.

WATER TANK
contains water with an optimal amount of nutrients.

Drip-Control Flow Valve

Irrigating Pipes

PUMP
Propels the water toward the irrigation tank

COLLECTING TANK
The water is collected, and its physical and chemical properties are analyzed.

SUBSTRATE
Inert materials, such as gravel or sand, work as substrates.

WATER
Water has long been known to be vital to plants.

