# FROM SEED TO SEED

Educational films on seed production

## TOMATO

The tomato belongs to the Solanaceae family and the Solanum lycopersicum species. It is an annual plant in temperate countries and sometimes perennial in tropical climates. There is a great diversity of tomatoes with thousands of varieties which differ in colour, shape, size, taste, length of growth, precocity, adaptation to cold, hot or humid conditions.
There are also tomatoes with an indeterminate growth, meaning that the plant will continue to produce new flowers and the harvest will spread out over a long period.
For tomatoes with a determinate growth, the plant?s flowering will be concentrated over a short period. The harvesting period will therefore be quite short.

### Pollination

Tomato flowers are hermaphrodite, which means that the male and female organs are on the same flower and the pollen on the stamen can fertilise the pistil of the same flower. The flower is therefore said to be self-fertilising.
In temperate regions, the reproductive organs are for most of the time well protected inside the flower. Cross-pollination is rare. There is a lot more cross-pollination in hot and tropical climates. It is the length of the pistil that indicates the risk of cross-pollination : it is easier for insects to pollinate a pistil that is longer than the stamen, than a short pistil hidden amongst stamen that have grown together.

Large fleshy tomatoes often have double blossoms. This increases the risk of cross-pollination. It is therefore indispensable to observe the flower structure of each variety, as well as the level of insect activity in your garden.
The risk of cross-pollination may be reduced by the presence of other flowers in the garden whose nectar is preferred by bees and bumblebees. Shaking the tomato plants several times a day when there is no wind will increase self-fertilisation.
In temperate regions avoid cross-pollination between varieties with short pistils that remain inside the flower by ensuring a distance of 3m between varieties. For varieties with long pistils that stick out, keep a distance of 9 to 12m.
In hot and tropical regions, keep a distance of 1km between varieties. This distance can be reduced to 200m if there is a natural barrier such as a hedge between them.
It is also possible to isolate varieties under a mosquito net. For this technique, consult the module on isolation techniques in the ABC of seed production.

## Life cycle

The tomato is an annual plant in temperate climates. In tropical regions, it can live for several years. Tomato plants grown for their seeds will be cultivated in the same way as those for consumption. With early varieties you will have to wait at least 40 days after the flower is in bloom before the fruit is fully ripe. This period can last as long as 60 or 80 days for mid-season or late varieties.
Selection should be done with plants that you have observed throughout their development and that correspond to the desired criteria.
With regard to the plant, look for regular and strong growth, early or late fructification, numerous flowers with good fructification. For varieties of determinate growth, choose compact plants with a short harvesting period. You should also taste the fruit and see if it is sweet or acid.
With regard to the fruit, look for the variety's typical characteristics: the size, the colour of the flesh, the beauty of the skin, and the number of lobes in the fruit. Selecting seeds from already picked tomatoes will not enable you to check all of the characteristics linked to the different varieties? growth.
Harvesting tomatoes for seeds should be done from healthy plants when the fruit are ripe and ready for consumption. It is best to choose the first or second group of flowers. It is also possible to pick tomatoes later in the season if the plants have resisted well to diseases. To ensure good genetic diversity within a variety, harvest tomatoes from 6 to 12 different plants and do not harvest from sick plants or damaged tomatoes.
If the fruits have not had time to mature on the plant (this may happen in cold climates or mountain regions), let the harvested fruit ripen in a warm place, such as a greenhouse or on a window sill.

## Extracting - sorting - storing

To extract the seeds, choose ripe but not fermented fruit. For small quantities of seeds, cut the fruit and put the seeds and part of the flesh in a glass jar using a spoon or by squeezing the tomato. For larger quantities of seeds, or for small cherry or wild tomato varieties, dice the fruit and mix everything in a blender.
Each tomato seed has a gelatin like an envelope which stops the seed from germinating. You should use a fermentation method to get this envelope to detach itself from the seed. Refer to the ?Extraction by fermentation, seed processing and selecting module in the ABC of Seed production?. After having processed the seeds using water, it is crucial to put them to dry immediately in a dry, shaded and well-ventilated area.
Another method for small quantities is dry them on coffee filters, as they are very absorbing and the seeds do not stick to them. Place at most a small teaspoon of seeds on each filter. Hang the sachets on a clothes' rack in a dry, airy, shaded and warm place.
Store the tomato seeds away from heat, moisture and light in a glass jar or in a plastic sachet. Don?t forget to insert a label indicating the year of production, the species and the variety.
The germination capacity of tomato seeds varies from 4 to 6 years. To lengthen this period, keep the seeds in a freezer.