

FR*ui*TROP

English version

**CLOSE-UP:
AVOCADO**

**Doha non-agreement
& the banana dispute**

**European apple & pear
harvest forecasts**

<http://passionfruit.cirad.fr>



Cultivation of avocado

Climatic requirements

Avocado can be grown in very different climates—from the equator to latitude 43° (that of Corsica in the northern hemisphere) and from sea level to an elevation of 2 500 metres in Mexico, Guatemala and Rwanda. However, two climatic requirements must be taken into account:

- a marked dry period during which floral induction takes place;
- minimum temperatures no lower than 7°C and maximums reaching at least 19° and 20°C during flowering (necessary for the dichogamy phenomenon).

Varieties of Mexican and Guatemalan origin and certain hybrids have good resistance to cold. In contrast, the West Indian varieties of Colombian origin are typically varieties requiring a tropical climate with a marked dry season.

Avocado requires large amounts of sunshine—at least 2 300 to 2 500 hours per year. As a whole, regions with more than 2 000 hours of sunshine per year are favourable. In general, growth and the production cycle are shorter when temperatures are high. The optimum is an average of 25°C during the hot months and 15°C during the cool months. Among commercial varieties, 'Bacon', 'Duke', 'Fuerte', 'Topa Topa' and 'Zutano' have good resistance to cold whereas 'Edranol', 'Hass', 'Nabal' and 'Taylor' are sensitive to low temperatures (from - 2°C) and 'Anaheim', 'Booth 7', 'Booth 8', 'Choquette', 'Hickson', 'Lula', 'Peterson', 'Pollock' and 'Waldin' are very sensitive (from - 1°C). Temperature also plays a role in the maturation of the fruits on the tree and on their quality. When fully developed, the fruits can stay on the tree for longer when the temperature is moderate.

Avocado requires a well-distributed supply of water totalling some 1 200 to 1 600 mm per year. Requirements are small during the floral induction and resting periods and higher from setting to harvest. Avocado also requires sufficiently high relative humidity during flowering (70 to 80 %) and then a more moderate level when the fruits grow. Relative humidity that is too high increases risk of the development of pests and diseases on both leaves and fruits (in particular *Cercospora*, scab, anthracnose, thrips and scales). A short water deficit (2 months) enhances floral initiation, especially in certain tropical climates where the temperature does not fall low enough to cause the complete stoppage of vegetation.

Avocado is sensitive to wind. The mechanical action of all winds can indirectly cause the wounding of fruits by rubbing or by blown sand grains. Dry winds like the sirocco and the harmattan are harmful for the plant overall (with a strong increase in evapotranspiration), especially during the flowering period. Finally, avocado trees are sensitive to salt spray as this causes leaf edge necrosis.



Soils

Internal and surface drainage of the land is important. Avocado is extremely sensitive to hydromorphic soils (that strongly retain water), even when this is not strongly marked and temporary. This sensitivity is associated with the presence of a fungus of the genus *Phytophthora* that attacks roots and the base of the trunk. In tropical regions, soils with a sandy texture are the most suitable for growing avocado. Furthermore, these soils generally display high permeability and drain rapidly after rainfall (good natural drainage). The topographical position affects soil moisture and drainage. Indeed, the land at the top of a slope or in mid-slope dries more quickly. Water from upstream (oblique drainage and possibly runoff) flows to land at the base of the slope and bottomland. The soil must be at least 1 metre deep and preferably 1.50 metre to enable the roots—especially taproots—to exploit a maximum soil volume.



Soil rich in fertilising elements is best for avocado. However, when fertilisation is possible, and hence the correction of deficiencies, only certain elements at toxic doses for the plant are a limiting factor for the crop. Aluminium and manganese toxicity can be eliminated by increasing

the pH to over 4.5 to 5.0 by application of calcium or calcium-magnesium soil amendment and of tricalcium phosphate. Toxicity resulting from excesses of various salts, and especially sodium chloride, is much more difficult to master.