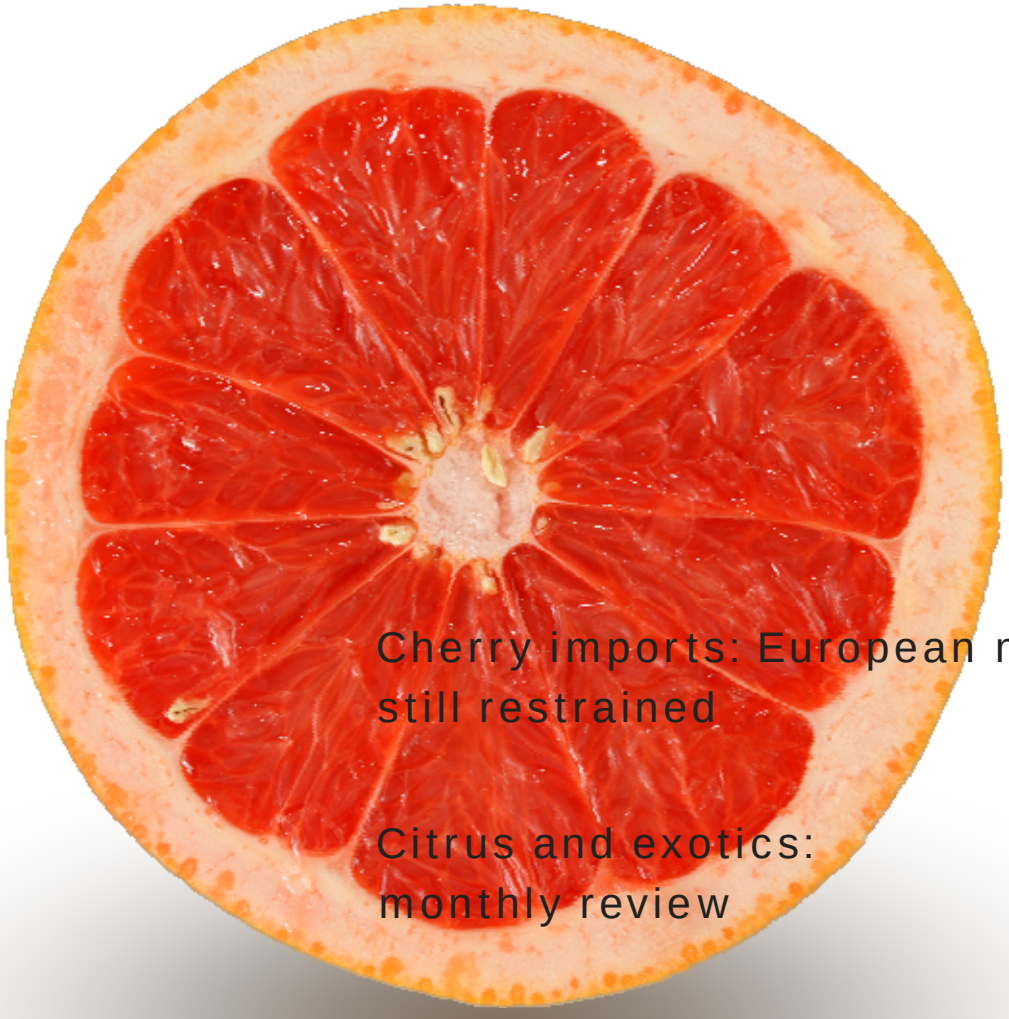
June 2011 - No. 190

FRuiTROP

English edition

CLOSE-UP

Grapefruit



Cherry imports: European market still restrained

Citrus and exotics: monthly review

http://passionfruit.cirad.fr

cirad

Cultivation of grapefruit

Climatic requirements and effect of the environment

The climatic requirements of grapefruit are fairly similar to those of other citrus but with a high temperature requirement. Low temperatures limit the cultivation area. Fruits sustain damage when the temperature falls below -1 or -2°C and the aerial parts of the tree are damaged from -3 or -4°C. Among environmental factors, temperature certainly has the greatest influence on fruit characteristics: shape, pulp and peel colour and organoleptic characteristics.

When production zone extremes are considered, it is easy to distinguish between 'tropical' quality and 'Mediterranean' quality. Tropical grapefruit have specific features because temperatures are at a steady high and day/night temperature amplitude is small. These conditions favour more intense internal and external fruit colour. Steadily high tropical temperatures enhance the development of lycopene, the red pigment found in the pulp and peel of coloured varieties. Chromatic potential is fully expressed in tropical grapefruit, with colours ranging from white to red via pink, depending on the case. These conditions also reduce bitterness and acidity and increase juice and sugar contents. The peel is often thinner and the fruit pear-shaped.

In a Mediterranean climate, except during the summer, day/night temperature amplitude is very marked and spring and autumn are cool to very cool. Here, grapefruit requires a warm exposition and plenty of sunshine. However, only the varieties with a very high lycopene content can become coloured. This is the case of comparatively recent cultivars bred in the last 25 years such as 'Star Ruby', 'Rio Red', 'Flame', etc. The production of pigmented fruits has become classic in a Mediterranean climate thanks to these varieties. Other varieties that are potentially coloured in the tropics, such as 'Thomson' (pink), 'Ruby', 'Red Blush' and 'Henderson' (red) acquire little or no colour.

The gentle, sweet taste characteristics of grapefruit were long closely associated with coloured varieties because of their exclusively tropical origin. We still have the habit of associating, a priori, sweetness and absence of bitterness with colour when this is not at all the case.

Cumulated heat in northern zones is not sufficient for the fruits to ripen fully before the winter. The production cycle may then last for 12 months or even more. The fruits must remain on the trees before completing their development in the following spring. They are exposed to rain and low temperatures and this can cause physiological damage to peel or internal damage in case of frost.

The plant

The grapefruit tree has broad, evergreen leaves and is one of the most vigorous of the genus Citrus. It requires the lowest planting density. When adult and fruiting, the fruit-bearing branches acquire a falling habit enhancing the growth of new shots on the curves. This means that the species can reach fairly naturally an equilibrium in branch renewal without drastic mechanical intervention.

Grapefruit diseases	Tristeza **Virus: Citrus Tristeza Closterovirus**	Chancre **Bacterium: *Xanthomonas axonopodis* pv. *citri***	Huanglongbing **(greening)** **Phloem bacteria: *Liberibacter africanum*, *L. asiaticum***
Symptoms	Decline of varieties budded on sour orange, paling of leaf veins, stem-pitting	Corky pustules on leaves, fruits and shoots	Yellowing shoots, leaf marbling, small poorly coloured fruits, decline
Part attacked	Young, growing organs (shoots, flowers)	Aerial parts: young organs, wounded organs	Aerial parts
Cause	Presence of infected plants in the field or nearby	Bacteria released from lesions, infection enhanced by mechanical or weather (hurricanes) wounds or the citrus leaf miner (*Phyllocnistis citrella*)	Presence of infected plants in the field or nearby
Transmission	Aphids: *Aphis gossypii* and *Toxoptera citricida*, budding	Via air and water	Psyllids: *Diaphorina citri* and *Tryoza erytreae*, budding
Measures to be taken	Control of vectors (chemical, biological control, etc.)	Application of products containing copper or Kasugamycin, removal of infected trees in case of light attack, watering at soil level	Control of vectors using chemical, biological methods, etc.
Prevention	Use of healthy plant material, cross-protection (measure subject to discussion)	Use of healthy plant material, tolerant varieties, protection of young organs	Use of healthy plant material
Economic impact	Loss of trees and decreased production, EU quarantine organism (control of movements)	Harvest loss by fruit fall, EU quarantine organism (control of movements)	Decline of trees, shorter orchard life, EU quarantine organism (control of movements)
Distribution	All regions except for certain countries in the Mediterranean area	Asia (including the Middle East), South America, Florida, small presence in Africa	Asia, tropical and subtropical Africa, the Middle East, Brazil, Florida

* A region harbouring an EU quarantine organism (listed in Council Directive 2000/29EC) may only export fresh produce to the EU under strict conditions.

Grapefruit pests	Fruit flies **Diptera Tephritidae, various species of the genera *Ceratitis*, *Anastrepha*, *Dacus*, *Bactrocera*, etc.**	Citrus leafborer **Lepidoptera: *Gracillariidae*, *Phyllocnistis citrella***	Aphids **Hemiptera: *Aphididae*, *Toxoptera* spp., *Aphis gossypii*, etc.**
Symptoms	Pricking caused by females laying eggs in the fruits. The larvae develop in the pulp and cause fruit fall	Characteristic meandering larval mines beneath leaf epidermis	Colonies on young shoots. Wilt caused by viruses (tristeza)
Part attacked	Fruit	Leaves, fruits in very rare cases	Young shoots
Measures to be taken	Monitoring of populations. Patch treatments, Male Annihilation Technique (MAT), mass trapping	Monitoring of populations. Biological control by acclimatisation of exotic parasitoids	Monitoring of populations (visual inspection). Conservation of beneficials. Spraying on a threshold basis
Prevention	Destruction of fallen fruits		
Economic impact	Harvest losses	The larval mines limit photosynthesis	Growth flushes limited. Weakening or wilting caused by viruses
Distribution	American continent: *Anastrepha*. Africa: *Ceratitis*, *Dacus*. Asia-Pacific: *Bactrocera*	Cosmopolitan	Variable according to species. *Toxoptera citricida* in tropical zones; *T. aurantii* in the Mediterranean area