

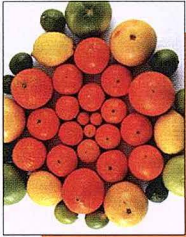
C
I
T
R
U
S

It will take professionals a long time to forget the 2006-2007 season. Although it was first and foremost a financial catastrophe for the producer countries with high production costs, it was also one of historically large harvests, an extremely paradoxical illustration of the success of Mediterranean citrus growing. Today, one citrus fruit in two sold on the international market is Mediterranean. However, for some seasons now the production systems in some countries seem to have been outstripping the nonetheless real growth of the international market, especially as weather conditions have often adversely affected consumption and fruit quality. It is true that retail distributors in western Europe are partly to blame this year once again. However, the upstream part of the chain should also heed the alarm bell, especially in Spain where some easy peeler growers have been particularly hard-hit. Nevertheless, Mediterranean producers possess a major advantage. Their unique varietal range of easy peelers and orange means that they can generate growth by lengthening the marketing season and by facilitating access to the numerous potential market growth areas in eastern Europe and North America today and in Asia and Latin America in the future.

Contents

p. 6	Review of the 2006-2007 winter citrus season: record production
p. 14	Review of the 2006-2007 winter citrus season: details by fruit category
p. 16	2007-2008 winter citrus season forecasts: details by producer country
p. 24	Statistics panorama: orange
p. 26	2007-2008 winter citrus season forecasts: details by fruit category
p. 28	Statistics panorama: easy peelers
p. 30	Citrus cultivation
p. 32	Citrus pests and diseases
p. 33	Citrus harvesting and storage
p. 34	Citrus varieties





Review of the 2006-2007 winter citrus season

Record production

Figure produced by the CIRAD Market News Service and by the CLAM (Mediterranean Citrus Liaison Committee) are used in this 'Close-up' on citrus.

10 million tonnes in 2006-2007, whereas it exceeded 16 million tonnes until 2004. The United States has even lost its third place to China, where production has displayed impressive

growth, increasing from 10 to 18 million tonnes in recent years. Chinese production is sold on the domestic market and the country is not present on the international market for either fresh citrus or juice. China could become the world's leading producer by the end of the decade.

More than one citrus fruit in two on the international market is Mediterranean

This generous harvest has enabled Mediterranean producers to export a record 6.8 million tonnes and to affirm their control of international citrus trade concerning some 12 million tonnes. Thus, more than one citrus fruit in two on the world market comes from the Mediterranean. The ratio reaches 75% for easy peelers and 58% for oranges, two Mediterranean specialities. To complete the picture, a respectable score of 45% for lemon should be added. Only grapefruit remains in the background. Because of its special physiological features, this citrus fruit requires the high, steady temperatures that are more common in subtropical regions.

The success of a 'terroir' and a policy of seeking new cultivars and new markets

This exemplary growth dynamics in production and exports is the result of a long term policy of specialisation in growing citrus fruits for the fresh market.

This approach is first and foremost extremely pragmatic and based on making use of all the advantages that the region possesses, and especially as regards climate. The cool winters make it possible to grow oranges and easy peelers with the right colour and flavour that is much appreciated because of the good sugar-acid balance. In addition, some sanitary constraints that form serious handicaps for the production and export of high-quality fresh citrus are not present around the Mediterranean (canker, variegated chlorosis, greening, etc.).

The range of easy peeler varieties grown by Mediterranean producers is without a doubt the broadest in the world and is also a key factor of this success. Spain has made a strong contribution to its enrichment by setting up facilities for

The record Mediterranean harvest—exceeding 20 million tonnes for the first time ever—is certainly one of the main noteworthy features of the 2006-2007 season. The third year of increase confirms the growth trend in Mediterranean production that had stagnated between 16 and 17 million tonnes until 2003-2004. Production reached record levels for all varietal groups except for grapefruit.

The Mediterranean, the world's leading citrus production region

The Mediterranean is thus at the summit of the world hierarchy of producer countries. This success deserves mention, even though it is probably temporary for reasons of the alternate bearing feature of citrus crops. However, the main feature to be underlined is growth as this contrasts with the stagnation or even the definite slump in the production of the other countries among the top three, focused on the juice industry. Areas under citrus are still decreasing in Brazil, the world's lead-

ing producer until the last season. Thus, in spite of the increase in yields, the harvest slid below the 20-million tonne mark in 2006, whereas it had exceeded 24 million tonnes at the end of the 1990s. The reason for this trend is a broad range of diseases (citrus variegated chlorosis, citrus canker, greening and sudden death

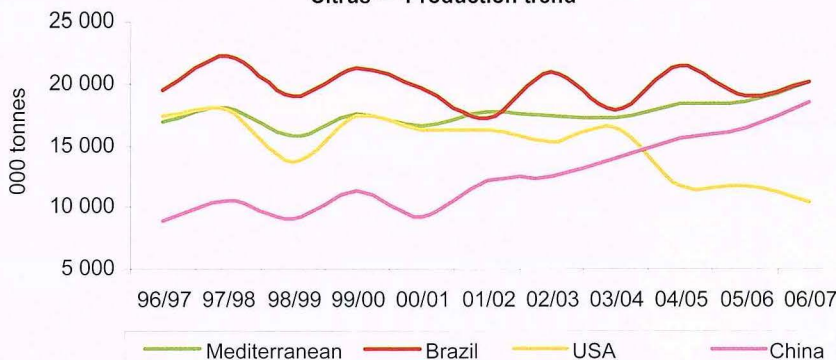
Citrus — Production evolution of the main producer countries

000 tonnes	2000-02 average	2006-07	Variation
Mediterranean	16 484	19 575	3 091
Spain	5 576	7 036	1 460
Italy	3 096	3 537	441
Egypt	2 705	3 024	319
Turkey	1 746	2 602	856
Morocco	1 067	1 285	218
Greece	1 245	976	-269
Israel	572	627	55
Tunisia	253	282	30
Cyprus	202	178	-25
France	24	29	5
Brazil	16 940	20 161	3 221
China	10 660	18 423	7 763
United States	16 200	10 300	-5 900

Source: CLAM, FAO

disease) that have hit orchards hard in the state of Sao Paulo, the main production zone in Brazil. The decrease has been even sharper in the United States. The spreading of greening and above all citrus canker by the hurricanes of autumns 2004 and 2005 sent production spiralling down to hardly more than

Citrus — Production trend



Source: CLAM, FAO



breeding and evaluating high-quality plant material and disseminating it in a very short time to citrus growers so that production can start rapidly thanks to top-grafting techniques. Breeders have sought varieties that extend the season and improve organoleptic qualities (colour at the beginning of the season, seedless cultivars, size, etc.). Supply has therefore broadened considerably in recent decades, especially thanks to several generations of early clementines, and quality has improved (for example with the replacement of 'Satsuma' by 'Marisol' and then 'Marisol' by 'Oronules'). Likewise the emergence of a broad range of easy peelers and dessert oranges like 'Lanelate' has made it possible to increase end-of-season supply considerably.

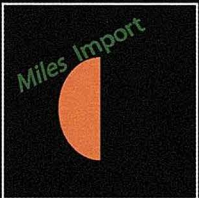
The opening of new markets has been one of the other driving forces of trade

Citrus — World trade in 2006-2007 — Tonnes			
	World trade	Mediterranean share	Main exporting countries
Orange	5 370 000	58%	Spain 1 450 000
			South Africa 900 000
			Egypt 760 000
			United States 546 000
			Morocco 264 000
Easy peelers	3 300 000	75%	Spain 1 656 000
			China 367 000
			Morocco 317 000
			Turkey 312 000
			South Africa 100 000
Lemon & lime	2 000 000	45%	Spain 497 000
			Mexico 387 000
			Argentina 355 000
			Turkey 328 000
			United States 116 000
Grapefruit	1 000 000	28%	United States 384 000
			South Africa 215 000
			Turkey 135 000
			Israel 78 000
			Spain 37 000
Total citrus	11 670 000	58%	Spain 3 640 000
			South Africa 1 215 100
			United States 1 046 021
			Egypt 793 800
			Turkey 775 174

Sources: professional sources, customs, FAO

and hence of production. With volumes peaking at 3.5 million tonnes in western Europe since the mid-1990s, Mediterranean exporters have sought to diversify outlets. As a result, the markets in east-

ern Europe were the main target of this diversification and the destination for most of the increase in Mediterranean production. The figures are impressive. Exports totalled some 1.3 million tonnes



AGRUMES DE
CONTRE SAISON

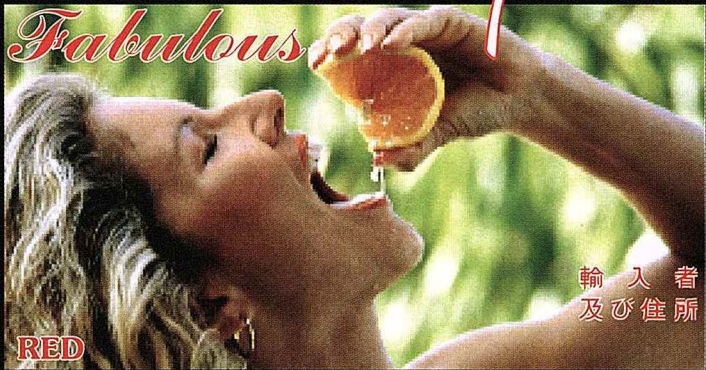
Miles Import

5, rue de la Corderie
CENTRA 310
94586 RUNGIS CEDEX

Tél. : +33 (0)1 41 80 10 10
Fax : +33 (0)1 41 80 10 15

Contact : Guy Lesvenan
g.lesvenan@wanadoo.fr

Miles Import

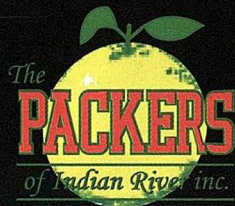


Votre partenaire en pomelos de Floride

FLORIDA



GRAPEFRUIT



AGRUMES DE
CONTRE SAISON

輸入者
及び住所





Espagne
Afrique du Sud
Floride
Israël
Honduras
Mexique



Tél: +33.(0)1.56.70.22.39 / +33.(0)6.75.03.76.54
RUNGIS - FRANCE - llisofreres@yahoo.fr

at the beginning of the 2000s and reached 2.2 million after another growth year in 2006-2007. These volumes form a third of total exports and the increase has been 900 000 tonnes in six years! It must be emphasised that growth has been much stronger in Russia and Ukraine than in the new member countries that joined the EU in 2004, where a decrease in imports of oranges reduced overall growth as a result of the marked development of the easy peeler market.

Shipments to North America, another major growth area, also continued to increase in 2006-2007. This was favoured by the destruction by frost of a large proportion of the Californian lemon and orange harvest. The volumes exported by Mediterranean operators—mainly Spanish and Moroccan—reached 200 000 t (some 50 000 t of oranges, 133 000 t of easy peelers and 20 000 t of lemons). This is dis-

son with the scale of production, but they resulted in profitable sales, relieving the easy peeler market that was saturated in November and December.



Contrasted dynamics from one country to another

This season confirmed the great variations in dynamics from one country to another. Growth continued to be very strong for three of the four main countries in the region that each ship more than 500 000 t of citrus. Spain, accounting alone for nearly 55% of total Mediterranean exports, continued its strong

increase in shipments of easy peelers and oranges to EU and eastern European destinations. Moroccan exports

tinctly larger than the 115 000 t of a normal season. It is true that the volumes might seem moderate in compar-

Citrus — Production in the Mediterranean region in 2006-2007

000 tonnes	Total	France	Spain	Morocco	Algeria	Tunisia	Italy	Israel	Cyprus	Greece	Turkey	Egypt	Gaza*
Easy peelers													
Production	5 442.5	28.8	2 501.1	535.4	111.0	71.0	590.2	140.0	51.0	72.6	628.9	712.5	-
Domestic sales	2 091.2	-	306.0	216.9	111.0	71.0	356.6	50.0	6.6	31.0	294.1	648.0	-
Industry	633.1	-	354.7	2.0	-	-	170.0	38.0	9.8	1.9	21.0	35.7	-
Losses/withdrawals	234.6	4.2	184.0	-	-	-	14.0	0.5	-	8.5	2.0	21.4	-
Export sales	2 484.6	24.6	1 656.4	316.5	-	-	50.2	51.5	35.0	31.2	311.8	7.4	-
Orange													
Production	10 882.1	-	3 396.4	720.5	140.0	180.0	2 356.1	188.0	72.0	855.6	974.9	1 939.2	59.4
Domestic sales	4 890.8	-	1 014.0	427.6	140.0	154.0	1 122.1	68.0	13.0	218.4	703.5	1 021.7	8.1
Industry	2 553.4	-	800.0	28.0	-	-	1 080.0	84.0	33.7	319.4	97.0	97.0	14.3
Losses/withdrawals	300.7	-	130.2	-	-	-	48.6	1.3	-	62.4	-	58.2	-
Export sales	3 133.5	-	1 452.2	264.9	-	26.0	105.0	34.7	21.6	255.4	174.4	762.3	37.0
Lemon													
Production	2 990.8	-	1 090.3	29.5	-	31.0	582.6	40.0	12.9	40.6	825.1	334.4	4.4
Domestic sales	1 227.3	-	150.0	28.0	-	31.0	252.3	34.0	3.1	35.4	406.9	284.8	1.8
Industry	584.0	-	238.0	-	-	-	280.0	4.0	4.0	0.4	40.0	16.7	0.9
Losses/withdrawals	282.6	-	205.1	-	-	-	11.7	2.0	0.3	3.5	50.0	10.0	-
Export sales	896.9	-	497.2	1.5	-	-	38.6	-	5.5	1.3	328.2	22.9	1.7
Grapefruit													
Production	578.5	-	48.4	-	-	-	7.1	259.3	41.6	7.2	172.7	37.7	4.5
Domestic sales	89.9	-	1.5	-	-	-	3.5	16.6	6.1	3.8	24.0	33.5	0.9
Industry	202.4	-	7.1	-	-	-	1.2	157.0	15.2	1.4	15.0	1.9	3.6
Losses/withdrawals	4.4	-	1.9	-	-	-	0.1	0.8	-	0.5	-	1.1	-
Export sales	281.8	-	37.9	-	-	-	2.3	84.9	20.3	1.5	133.7	1.2	-
Others													
Production	11.6	-	-	-	-	-	-	11.0	-	-	0.6	-	-
Domestic sales	4.2	-	-	-	-	-	-	4.2	-	-	-	-	-
Industry	-	-	-	-	-	-	-	-	-	-	-	-	-
Losses/withdrawals	-	-	-	-	-	-	-	-	-	-	-	-	-
Export sales	7.4	-	-	-	-	-	-	6.8	-	-	0.6	-	-
Total citrus													
Production	19 905.4	28.8	7 036.2	1 285.4	251.0	282.0	3 535.9	638.3	177.5	976.0	2 602.2	3 023.8	68.3
Domestic sales	8 303.5	-	1 471.5	672.5	251.0	256.0	1 734.9	172.8	28.9	288.6	1 428.5	1 988.0	10.8
Industry	3 972.9	-	1 399.8	30.0	-	-	1 531.2	283.0	62.7	323.1	173.0	151.3	18.8
Losses/withdrawals	822.3	4.2	521.2	-	-	-	74.4	4.6	0.3	74.9	52.0	90.7	-
Export sales	6 804.2	24.6	3 643.7	582.9	-	26.0	196.1	177.9	82.4	289.4	948.7	793.8	38.7

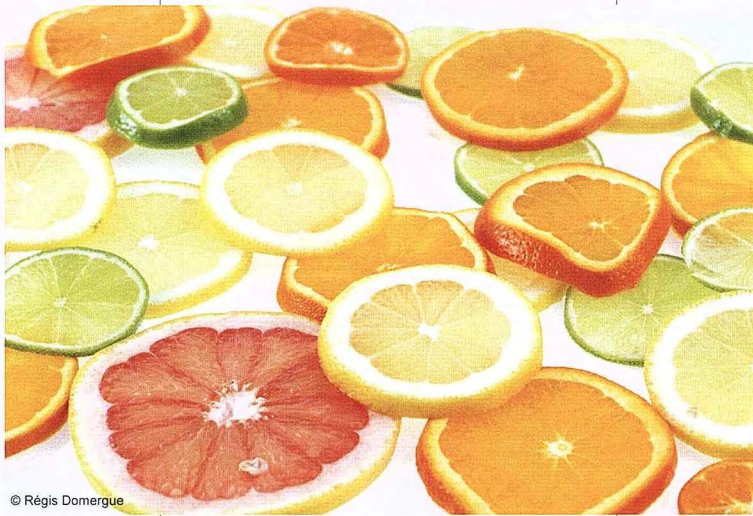
* estimates / Source: CLAM



continued to increase thanks to ever larger shipments of clementines to the Russian market and, to a lesser extent, to North America. The most spectacular movement was certainly the increase in the already strong growth of Egyptian exports, consisting mainly of 'Navel' and 'Valencia' oranges. Shipments increased by 150 000 t thanks to the development of outlets in neighbouring Arab countries. In six seasons, Egyptian exports to all destinations increased from about 200 000 t to nearly 800 000 t in 2006-2007. In contrast, the increase in Turkish shipments, that had been exemplary in recent years, was interrupted as a result of a shortfall in grapefruit production and eastern European markets that were more difficult for oranges. However, total volumes were still very large at close to a million tonnes.

The performances of the countries shipping less than 300 000 t were more contrasted. Only Israel achieved another year of growth, confirming the recovery of citrus growing. Although shortage of

terrestrial EU countries, still faced with serious problems of competitiveness (Greece and Italy) and drought (Cyprus). What a contrast with Spain, where the context as regards trade and regulations is nevertheless similar! The cumulated exports of Greece and Cyprus have decreased by more than 60 000 t since the end of the 1990s. This observation should be qualified for Italy, where the PGI approach seems to be succeeding in halting the decrease. The first massive shipments of blood oranges from Sicily to North America (about 6 000 t to the USA and 1 000 t to Canada) and Japan (7 600 t) should be noted. But will a development model based on specialties make it possible to re-launch citrus growing in Italy? Although this option seems judicious for Corsica, where 25 000 t of clementine and 4 000 t of grapefruit are grown, would



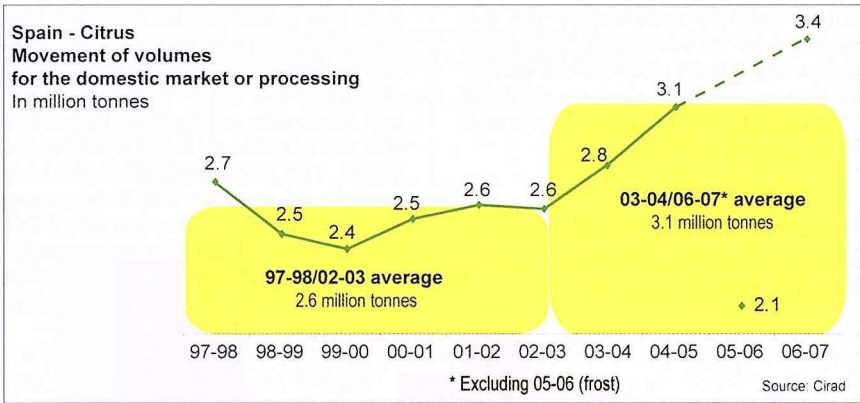
© Régis Domergue

labour is still a problem, the use of recycled water has made it possible to solve the crucial problem of irrigation. A downward trend was seen in the other Medi-

Citrus — Mediterranean region — Exports by variety in 2006-2007

000 tonnes	Total	France	Spain	Morocco	Algeria	Tunisia	Italy	Israel	Cyprus	Greece	Turkey	Egypt*	Gaza*
Total easy peelers	2 484.6	24.6	1 656.4	316.5	-	-	50.2	51.5	35.0	31.2	311.8	7.4	-
Satsuma	225.5	-	78.6	-	-	-	-	-	-	-	146.9	-	-
Clementine	1 598.5	24.6	1 195.3	293.2	-	-	46.0	-	-	28.4	11.0	-	-
Mandarin/Wilking	226.8	-	108.9	-	-	-	4.2	-	-	-	106.3	7.4	-
Ortanique	46.6	-	-	8.1	-	-	-	5.8	32.7	-	-	-	-
Nova	199.7	-	137.7	3.2	-	-	-	15.7	1.0	-	42.1	-	-
Others	187.5	-	135.9	12.0	-	-	-	30.0	1.3	2.8	5.5	-	-
Total oranges	3 133.5	-	1 452.2	264.9	-	26.0	105.0	34.7	21.6	255.4	174.4	762.3	37.0
Navel/Navelina	1 444.9	-	667.0	30.3	-	4.3	-	1.5	7.0	193.1	144.1	397.6	-
Salustiana	153.6	-	121.8	31.8	-	-	-	-	-	-	-	-	-
Shamouti	31.8	-	-	-	-	-	-	24.4	-	-	1.4	-	6.0
Common blond	44.3	-	-	-	-	4.3	-	-	-	14.3	1.2	24.5	-
Moro-Tarocco	105.0	-	-	-	-	-	105.0	-	-	-	-	-	-
Maltese	15.9	-	-	-	-	15.9	-	-	-	-	-	-	-
Sanguinelli	-	-	-	-	-	-	-	-	-	-	-	-	-
Other blood oranges	39.5	-	-	39.4	-	-	-	-	-	-	0.1	-	-
Verna	14.9	-	14.9	-	-	-	-	-	-	-	-	-	-
Oval	2.3	-	-	-	-	-	-	-	-	-	2.3	-	-
Late	1 275.2	-	646.3	163.4	-	1.4	-	8.8	14.6	48.0	25.3	336.4	31.0
Bitter	6.0	-	2.2	-	-	-	-	-	-	-	-	3.8	-
Total grapefruits	281.8	-	37.9	-	-	-	2.3	84.9	20.3	1.5	133.7	1.2	-
White grapefruits	83.0	-	37.9	-	-	-	2.3	9.5	20.3	1.0	9.0	1.2	-
Other grapefruits	200.6	-	-	-	-	-	-	75.4	-	0.5	124.7	-	-
Total lemons	896.9	-	497.2	1.5	-	-	38.6	-	5.5	1.3	328.2	22.9	1.7
Other citrus	7.4	-	-	-	-	-	-	6.8	-	-	0.6	-	-
Total	6 804.2	24.6	3 643.7	582.9	-	26.0	196.1	177.9	82.4	289.4	948.7	793.8	38.7

* estimates / Source: CLAM



the same apply to the Italian citrus industry with production of more than 3 million tonnes? In 2006-2007, Italy was a net importer of fresh citrus!

Catastrophic results for some suppliers

However, although the results are indisputably positive in terms of volumes exported, the economic results have been very poor for certain suppliers once again. Spain, where production increased from 5.4 million tonnes at the end of the 1990s to more than 7 million tonnes in 2006-2007, is one of the most seriously affected countries. Successive crises in recent seasons are reported to have caused cumulated losses of about EUR 500 million for citrus growers in the Community of Valencia, of which 220 million was sustained in the 2006-2007 season alone, according to the grower's association Unió-COAG.

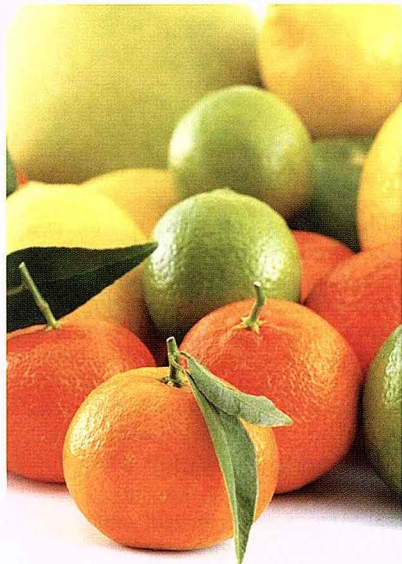
Very large volumes of easy peelers in November and December

The crisis started once again in November. This has become a danger season because of the rocketing increase in Spanish clementine supplies, with production increasing from about 600 000 t at the beginning of the 2000s to nearly a million tonnes in 2006-2007; the quantity of 'Nules' alone has increased by some 350 000 t. In the 2006-2007 season, the quantity of easy peelers to be sold by Mediterranean producer countries as a whole exceeded 550 000 t in November and 650 000 t in December.

Weather—another major crisis factor

However, another conjunctural component of the season acted as a detonator. The weather was too warm, slowing consumption and causing fruit quality

problems after a rainy period. The scenario of this 'November crisis' is now well known. Supplies of the season's clementines are still very large and the market is overloaded with early clementines that remain unsold—in spite of the efforts made to improve quality by means of new varieties—because of temperatures that are too



© Régis Domergue

high in September and October. In parallel, demand is inadequate, especially when the warm weather continues and high humidity affects quality. The crisis takes root and spreads. The competition from easy peelers at very competitive prices slows sales of oranges; stocks are carried over, affecting the rest of the

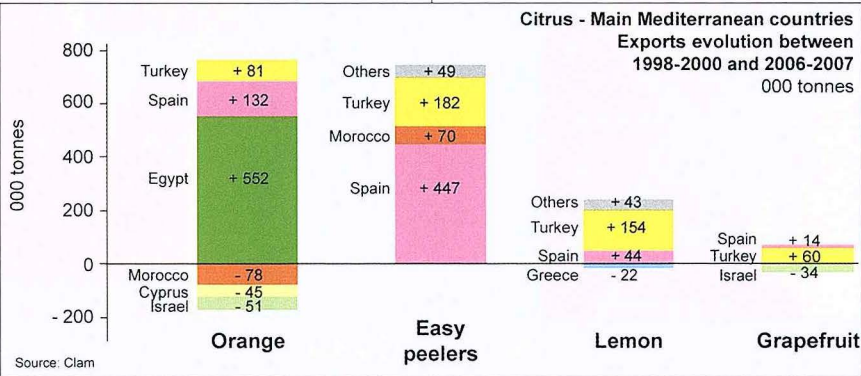
season, which is also increasingly encumbered with 'Lanelate' and 'Navelate'.

With this succession of crises, producers are wondering about the future. The problem takes a special dimension in the countries where cost price is high and even turns into a debate for society in those where water availability is becoming a critical feature. Should this scarce resource be used to grow citrus fruits of which a proportion will be sold at a loss or even left on the trees? This question is justified.

Initiatives—often private—to address the crisis in Spain

For lack of funding, the very ambitious objectives of the support plan for the citrus sector unveiled by the chamber of agriculture of the Valencia regional government at the end of 2005 are far from being attained (*Fruitrop* 128). However, real progress has been made in priority fields to stem the crisis, often thanks to initiatives by grouped private operators. The Ceven (*Central de Venta de Citricos*) was set up in April 2007 with the aim of ensuring a decent income for growers by strengthening their negotiating power downstream. By grouping a considerable proportion of supply, the body aims at becoming a key player in order to be able to set a minimum price that covers production cost. Furthermore, this system would make it possible to put an end to transactions 'a resultados' in which the producer is paid according to the sum of the final sale by the middleman and has no guaranteed remuneration. The idea is an attractive one, but in October Ceven represented only 8% of Spanish production, even though it handled 500 000 t.

The strengthening of juice production capacity is also an important point for using sorting rejects and above all for the regulation of supplies for the fresh market—and especially easy peelers. Thus Zuvamesa, a unit with final capacity of 400 000 t, should become operational during the 2007-2008 season.



Varietal reconversion should also continue even if the large-scale plan designed by the Valencia government has not been finalised for lack of funding. The new varieties available (triploids, some of which are from University of California, Riverside, hybrids such as 'Moncadasin' or induced mutation as with 'Tango' bred from 'Nadorcott') will make it possible to continue to extend the sales calendar and probably—by means of top grafting on 'Nules'—to reduce supply pressure in November and December, both overloaded months. The idea is to use the existing consumption potential in the late segment in markets, including those that many people consider to be saturated, such as that of the former EU-15. This approach has already been used successfully in orange with 'Navelate'. The prospects for increased production, in particular in Andalusia, and the present crisis in the easy peeler sector demonstrate the advantage of continuing this approach, with varieties like 'Powell Summer Navel' that can supply the high-quality dessert orange market until June. Citrus exporting countries in the southern hemisphere must take this change into consideration as it obviously encroaches on their market (*Fruitrop* 133). Unfortunately, lemon growers in the Murcia region do not possess this varietal advantage at the moment. Work has begun on replacing the cultivars that are

not completely satisfactory but this needs time. Production is too large, consumption lacks elasticity and competition is fierce. Thus, planning the grubbing up of part of the orchards seems to be an inevitable measure.

Different development models in different countries—and not always balanced

fruits and production for a market window in which consumption is likely to increase. Thus the varieties most sought after today are 'Or' in 'Israel' and 'Nour' and 'Nadorcott' in Morocco. Efforts are also being made to develop alternative outlets. The processing industry is well-established in Israel and is becoming established again in Morocco after FRUMAT closed in 2004. Likewise, particular attention is paid to the domestic market in Morocco, where a promotion campaign started in 2006-2007.

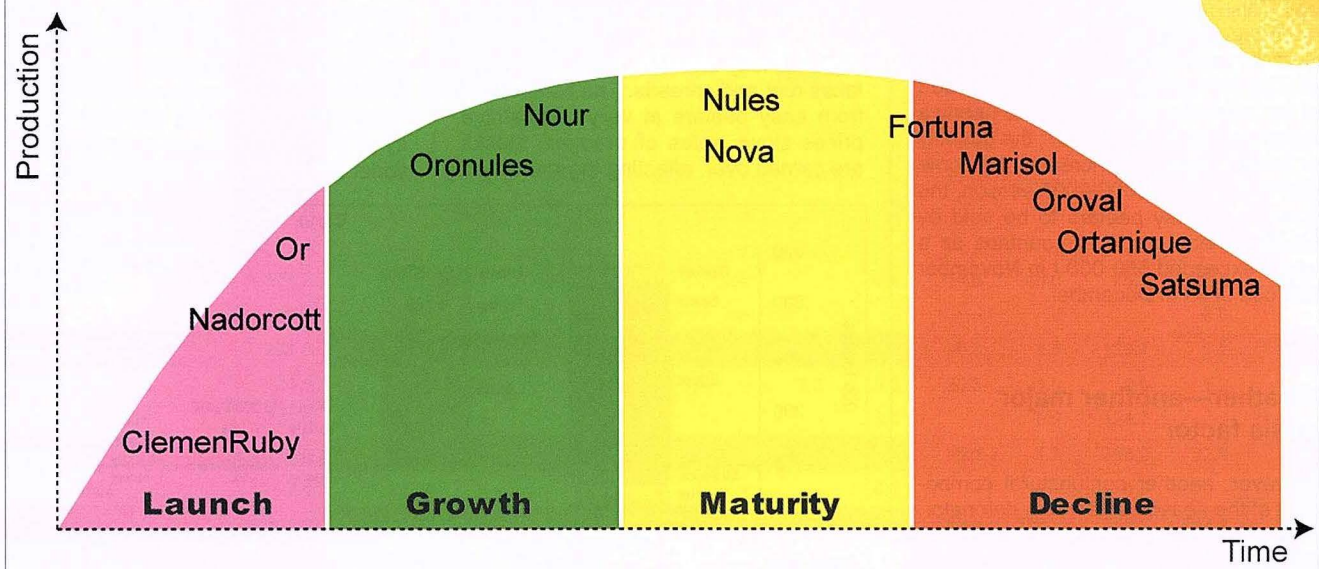
© Régis Domergue



Although less affected by the crisis, other producer countries have nevertheless taken stock of the situation. Thus Morocco and Israel are working on real growth in the sector (+ 3 000 ha in Morocco and + 1 000 ha in Israel between 2005 and 2006) with a development approach in which awareness plays a role. The choice of varieties makes it possible to both ensure good quality

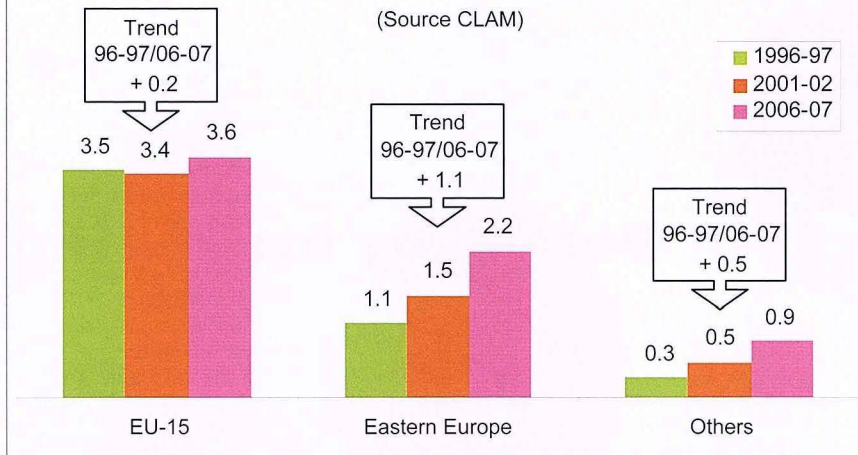
Is this the same approach as that used in Egypt and Turkey, where areas under citrus are also increasing rapidly? It would seem rather that producers are counting on their comparative advantages in terms of production cost, especially in Egypt. The range of cultivars is very narrow, alternative outlets are limited to the domestic market and the processing industry is undersized. It is true that export figures show that this model appears to work today. However, the example of Russia shows that the quality standards of what used to be emerging markets soon adopt the quality standards of the west. It is important to stress that it seems to be the right time to initiate industrial projects. While the juice sector is very small, especially for concentrate, the positive effects of the collapse of Florida production on prices seem to be lasting.

Easy peelers - Varietal range A life-cycle like that of industrial products



Citrus — Mediterranean exports Evolution by market — in million tonnes

(Source CLAM)



Large consumption potential is still available, right now and in the medium term

In addition to the measures already taken in some countries, Mediterranean producers possess another advantage that allows them to envisage the future with a certain serenity. The eastern European countries still have very accessible potential for growth. Easy peeler consumption in the 12 new EU member countries is still well below that of western

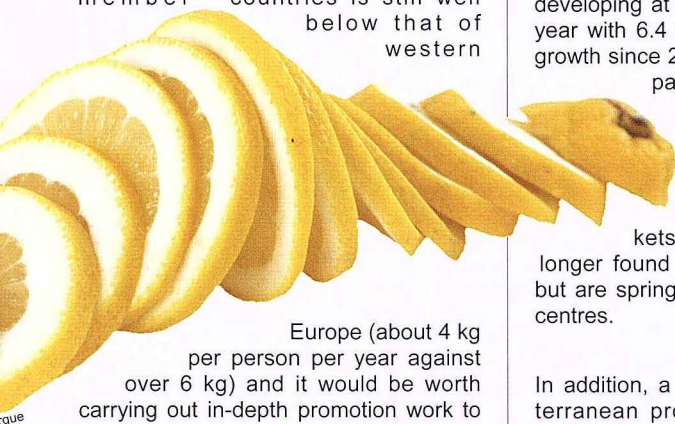
There is probably even more room for manoeuvre in Russia where total citrus consumption is only about 6 kg per person per year. In addition, the market for imported fruit seems to have gained second wind. Average per capita income is still increasing rapidly thanks to buoyant economic growth. It is true that it is fairly low in absolute terms but the proportion of disposable income is larger than in most developed countries. Taxes are low and Russians generally have little debt. Thus the retail trade is developing at the rate of 10 to 12% per year with 6.4 to 7.4% overall economic growth since 2003. Furthermore, a comparatively new factor is the fast increase in the number of modern retail distribution structures that satisfy consumers' desire to buy. Supermarkets and superstores are no longer found just in a few large cities but are springing up in provincial urban centres.

In addition, a large proportion of Mediterranean production that meets the strict quality standards required by public regulations or by private specifica-

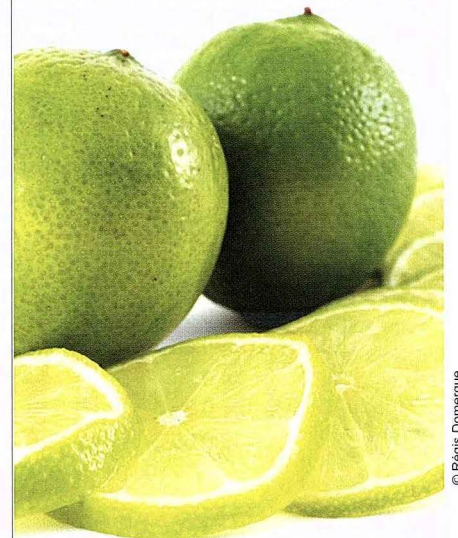
tions can be competitive on most of the world's markets. However, gaining a foothold in Asia (Japan, Korea and China) or Latin America often requires the respect of rigorous sanitary procedures. It is essential that the efforts made to eradicate the Mediterranean fruitfly, the main problem for access to certain markets for the Mediterranean region, should be continued. The eastern European markets do not have unlimited capacity and the winning remote markets will take time.

Even if the crisis experienced by certain producer countries is clearly real, the picture is not black. Producers have already set up facilities to address it and even have growth potential to ensure the future development of the sector. In both cases, choices of varieties and the existence of alternative outlets seem to be determinant features for the future ■

Eric Imbert, Cirad
eric.imbert@cirad.fr



Europe (about 4 kg per person per year against over 6 kg) and it would be worth carrying out in-depth promotion work to re-launch an orange market that is at best stagnant and very disappointing.



© Régis Domergue

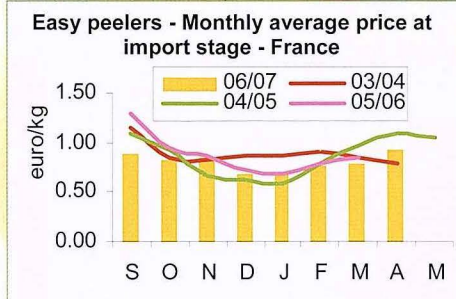
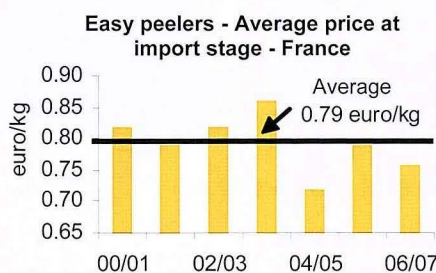


FAIRTRADE AND ORGANIC FRUIT

For more information: www.okefruit.com

Easy peelers

The size of the Mediterranean harvest—exceeding 5.3 million tonnes for the first time—led to fearing a difficult season. The situation was even more critical than expected, especially for Spanish producers, as in addition the weather was unfavourable for consumption and for the keeping qualities of the fruits. The season started badly in spite of the better quality of early clementines as a result of the continued replacement of 'Marisol' by other better appreciated cultivars such as 'Oronules'. Large volumes had to be sold and retailing was difficult as the weather was unusually warm for the season. Prices soon fell below average, especially for the large quantities of small fruits available. The quantities of early clementine carried over aggravated the quasi-structural weakness of the market during the heart of the season because of the large quantities of 'Nules' from Spain. In addition, heavy rainfall in the Valencia region combined with abnormal warmth affected the keeping qualities of the fruits. The market slipped in mid-November with prices reaching extremely low levels on all the European markets. This caused a serious crisis at the production stage in Spain as the producer price was often lower than production costs. Even the Spanish brands with strict standards suffered from the situation; sales were more fluid than those of ordinary fruits but the prices were extremely low. There then followed a succession of quality problems and sales difficulties until the end of the season. In this extremely difficult context in the EU, Moroccan exporters focused their shipments on Russia and Canada. Only a few suppliers or varieties succeeded in standing out as regards quality and performed satisfactorily. In the mid-season segment, spared by rain, Corsican shippers working in the mid-season period performed well in clementine in terms of both volume and price thanks to satisfactory quality and marketing that is now well structured. The late segment saw the success of high-quality varieties such as 'Or' from Israel, whose exports reached a record level, and 'Nadorcott' from Morocco and Spain.



Review of the 2006-2007 winter citrus season

Details by fruit category

Source: Cirad

Lemon

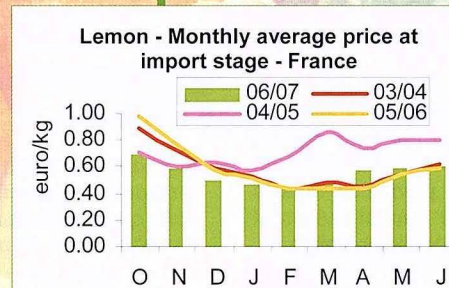
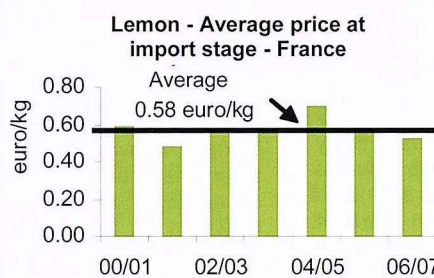
Another season with poor results. Exported volumes nevertheless reached a record level of nearly 900 000 t, thanks in particular to the sometimes opportunist development of shipments to countries

previously only slightly or not at all open: Spain exported 20 000 t to the United States after frost hit the California harvest and Turkey sent larger volumes to Saudi Arabia. However, production was too large, approaching 3 million tonnes for the first time. More than 200 000 of the 1.1 million tonnes

grown in Spain was not sold, as a result of very strong competition from Turkey and Argentina during the first part of the season.

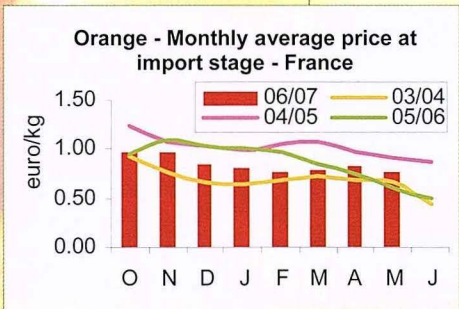
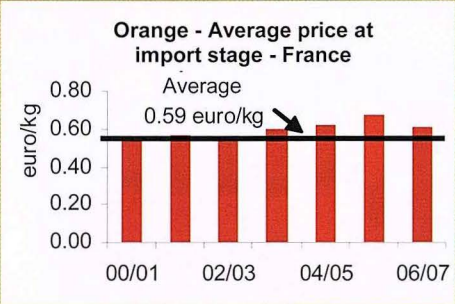
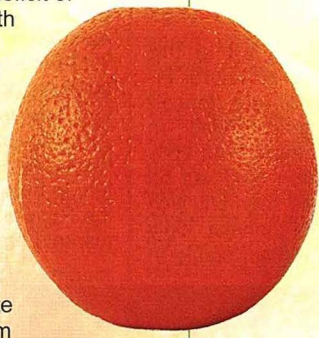
The abandoning or reconversion of plantations is continuing in the Murcia region. In this context, Cyprus and Greece confirmed their almost complete disappearance from

the market, especially as past or present meteorological problems aggravated the problem of competition with other suppliers (frost in Greece in the 2000s and drought in Cyprus). In contrast, Italian shipments continued to increase while remaining moderate (less than 40 000 t), thanks to a differentiation strategy based on PGIs (lemon from Sorrento and Amalfi) and organic production. Likewise, Egyptian exports totalled some 20 000 t for the second season running, with sweet lemon exports sold on a niche market in neighbouring countries that is little affected by international competition.

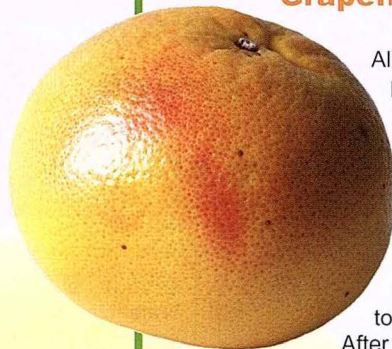


Orange

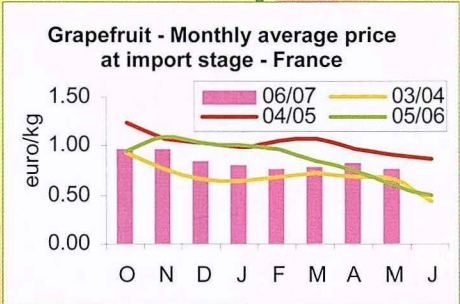
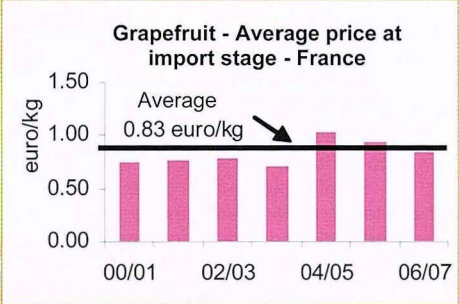
The season started well. First, only moderate volumes of late fruits from the southern hemisphere were available in October: South African production displayed a deficit of about 20% in comparison with the average and Argentinian exports to the EU decreased by 10%. In addition, the Spanish 'Naveline' harvest was larger than the preceding year's but still short. Thus referencing swung into the hands of Spanish shippers at an early date and prices held at a healthy level in spite of only moderate demand because of the warm weather. The situation changed in November. Demand was too slow (very competitively-priced easy peelers and very warm weather that did not stimulate consumption) and a few keeping quality problems resulting from the weather tipped the market over the edge. Prices fell and in December and January stabilised at a level as low as in 2005-2006. The situation worsened distinctly in February with the beginning of a record 'Lanelate'/'Navelate' in Spain. Price plummeted to hitherto unseen depths at both import and production stage, especially as some 'Navel' oranges, often of uneven quality, were still available on the market. The volumes exported to the United States after the California frost did not change the trend. Only 'Maltese' from Tunisia performed well in a niche market after a difficult start. In this context of too much produce, Spanish shippers decided to delay the start of the 'Valencia' season and Moroccan exporters concentrated on Russia. The EU market turned around in a totally unhopd-for manner in April. Sales were well above average thanks to a serious shortage of competing fruits and attractive retail prices for oranges. The 'Valencia' season finished early in June and prices were fairly strong.

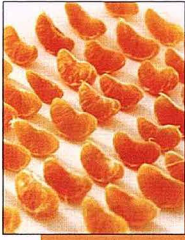


Grapefruit



All professionals expected a winter season marked by a serious shortage of fruits. But it can now be seen that the EU market was much more amply supplied than expected and returned to an average level. After oscillating between 230 000 and 245 000 t during the two previous seasons, arrivals in EU-25 from September to May probably exceeded 280 000 t, that is to say a return to volumes close to those available before the Florida hurricanes. Although shipments from Florida were still distinctly short, they increased more than expected to 4.3 million boxes after 2.8 millions in 2004-2005 and 2.1 millions in 2005-2006. In parallel, the appearance or more marked presence of small supply sources also contributed to the increase. Firstly, the quantities shipped by the Central American and Caribbean suppliers who ship produce for the inter-season were larger than in previous years and the seasons were longer. Thus, Cuba returned to the market, large volumes were shipped from Honduras and Mexico was more strongly present and less restricted as regards season with the increase in export supplies from a new region, Michoacán. Secondly, imports of shaddock from China increased enormously, exceeding 20 000 t. The Mediterranean suppliers therefore lost market shares in this extremely competitive context. Sales totalled some 150 000 t, a decrease in comparison with the 180 000 t shifted in 2005-2006 but still distinctly larger than the 125 000 t of the seasons preceding the 2004 hurricanes. The prices paid were satisfactory for Florida but disappointing for the other suppliers and provide interesting information about market mechanisms. The two main market segments, that is to say top quality and budget fruits, appear to be strictly compartmentalised. The market for top quality fruits remained under-supplied while the other segments were fairly heavily stocked.





2007-2008 winter citrus season forecasts

Details by producer country

Spain

Seasons come and go and are never the same. With a harvest forecast of 5.6 million tonnes, 2007-2008 will be more than 20% down on the record 7 million tonnes of the preceding season. The decrease results mainly from unfavourable weather conditions that affected fruit setting and aggravated physiological fruit fall—that would probably have been considerable already, given the size of the previous harvest. Furthermore, drought also had an impact, especially in Andalusia. The easy peeler harvest will be down overall (all varieties) by some 10% in comparison with the four-year average. The decrease will be very marked in the heart of the season, with small 'Nules' and 'Clemenvilla' harvests. In contrast the dip will be a little less marked at the end of the season with the continued reconversion of 'Fortuna' but an increase in late hybrids such as 'Nadorcott', as was the case in the early part of the season with the increased momentum of 'Oronules' and 'Clemenruby', which are gradually replacing 'Marisol'. The 7% shortfall of the orange harvest in comparison with average hides a very strong decrease in the availability of fruits—both juice and dessert varieties—at the beginning of the season and mediocre volumes during the second part of the

season, with a strong deficit in the 'Valencia' harvest and the structural increase in the production of late dessert varieties like 'Lanelate' and 'Powell'. In contrast, the decrease to more than 25% below average in the lemon crop will be particularly visible in the late segment, with an extremely limited 'Verna' harvest. Only grapefruit production will remain stable in

© Régis Domergue



comparison with last year and will be larger than average.

This comparatively modest harvest should allow a return to profitability, while waiting for the setting up of mainly private initiatives aimed at preventing slumps as serious as last season's. Juice industry capacity was too small in 2006-2007 and is to be increased from the word go this time with the coming into service of a new 250 000 t

unit (Zuvamesa) in the Valencia administrative region. In particular, this should enable better regulation of the volumes available on the fresh citrus market, and especially the quantities of easy peelers marketed during the critical November-December period. Other units have been set up recently or are at the planning stage (Citricos del Andévalo near Huelva was set up recently and there is a project at Cartaya). This season will also be a test for the Ceven purchase centre set up in April 2007 to group fruits and better defend producers' interests with regard to the downstream part of the chain. Efforts to find new markets will be continued. The Valencia regional government is to provide the support of its export development institute to help exporters to gain a foothold on the Russian market. In addition, the Asian markets are still targeted by certain cooperatives. Test shipments to the Chinese, Japanese and Korean markets will be repeated. Mexico might prove to be an addition to Spanish exporters' portfolio, which totalled 82 countries in 2006-2007.

Finally, from spring 2008 onwards, growers should be able to obtain five new varieties of late easy peelers to enable them to lengthen their marketing season. Two were from mutation of 'Murcott' and 'Moncada' (an 'Oroval' x 'Kara' cross) and the three others were bred by hybridisation ('Fortune' crossed with 'Ellendale', 'Murcott' or 'Kara'). 'Tango', the result of a controlled mutation of 'Nadorcott' performed at University of California Riverside should very soon complete the range, joining the five other cultivars currently being studied at IVIA. In fact, figures for 2006 plantings show that the areas devoted to early easy peelers and oranges are tending to decrease to the benefit of late varieties.

These statistics also show that even if sales of seedlings have fallen by about 20% in comparison with 2005, areas under both easy peelers and orange continue to increase, especially in Andalusia where the total has grown from 47 000 ha in 2000 to more than 65 000 ha in 2006. The sector should therefore continue to be very aware of the points mentioned above so as not to risk further serious slumps in the future.

Florida

A harvest attaining the some 25 million 85-lb (40.8-kg) field boxes forecast will keep Florida's position of leading producer country. Nevertheless, this is 2 million boxes less than the 2006-2007 season and about 20 million boxes less than the

Spain — Citrus — 2007-2008 export forecasts

000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Total clementines	1 050	1 195	- 12%	1 063	- 1%
Satsuma	50	79	- 36%	96	- 48%
Mandarin/Wilking	50	109	- 54%	114	- 56%
Nova	125	138	- 9%	137	- 9%
Others	155	136	+ 14%	97	+ 60%
Total hybrids	380	461	- 18%	444	- 14%
Total easy peelers	1 430	1 656	- 14%	1 507	- 5%
Naveline/Navel	500	667	- 25%	761	- 34%
Blond	115	122	- 6%	117	- 2%
Blood	12	15	- 19%	10	+ 16%
Late	616	661	- 7%	490	+ 26%
Total oranges	1 231	1 450	- 15%	1 369	- 10%
Total lemons	445	497	- 10%	479	- 7%
Total grapefruits	38	38	- 1%	33	+ 12%
Total général	3 144	3 642	- 14%	3 388	- 7%

Source: CLAM

Florida — Citrus — 2007-2008 export forecasts

millions boxes 85 lb (38.6 kg)	Season		Evolution	2000-2004 average	2007-2008 / average
	2007-2008	2006-2007			
White grapefruit	9.0	9.3	- 3%	17.4	- 47%
Coloured grapefruit	16.0	17.9	- 11%	25.7	- 30%
Total grapefruit	25.0	27.2	- 8%	43.1	- 37%

Source: FDOC

40 million boxes of the seasons preceding the explosion of citrus canker spread by the 2004 and 2005 hurricanes

The 2007 agricultural census covering half of the citrus area shows that the orchards are still shrinking (- 5% from 2006 to 2007). These data confirm FDOC's production forecasts which did not show a marked increase in volumes in the medium term: 30 million field boxes at the beginning of the next decade if the impact of canker is only medium. The consequences of greening, identified during summer 2005 and that also spread rapidly, are not included in this scenario. Profitability decreased strongly in 2006-2007, and this does not encourage replanting. Although fresh fruits are still an interesting outlet, the economic returns of industry, the destination of nearly 60% of the volumes, have been practically nil. However, it should be stressed that with exports exceeding 400 000 t in 2006-2007 and what will probably be a comparable total in

2007-2008, Florida should remain the world market's leading supplier for many years, unless there are further meteorological catastrophes.

The small size of the fruits this year—the result of a very dry spring—is a subject to be borne in mind. Combined with somewhat late ripening, this factor will result in moderate volumes during the first part of the season. In contrast, autumn rainfall resulted in a size gain and should allow a return to supplies more similar to those of last season at the beginning of 2008. Japan will remain the main market for Florida grapefruit. However, the strong euro may encourage European importers to increase their orders.

USDA intends to lighten the procedure set up in 2006 to prevent the spread of citrus canker outside Florida after it was stated that it is impossible to eradicate the disease. The fruits shipped to countries where citrus fruits are not grown will only be inspected at the packing station and the orchard control and approval measures will be suspended. Shipments to citrus-producing countries will still be forbidden.

Tunisia

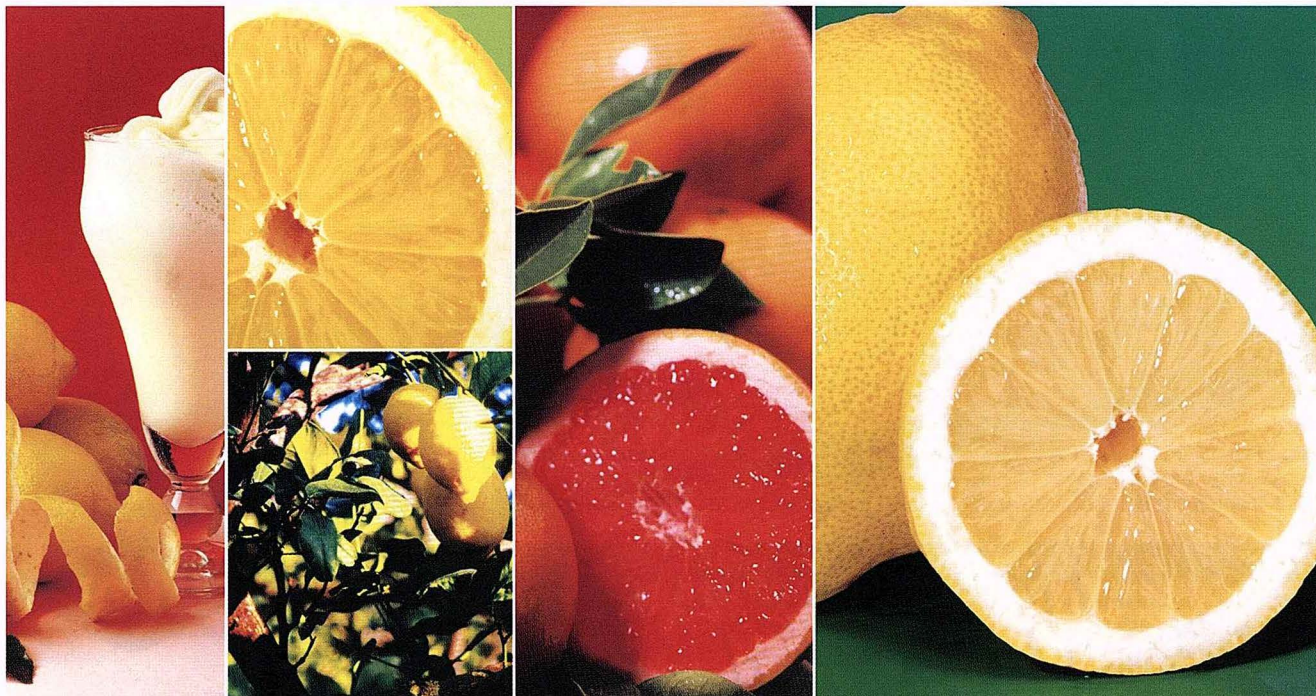
Production is increasing for the fifth consecutive year and the total citrus crop should reach 300 000 t. The orange harvest of some 185 000 t will not be the only one to increase. The easy peeler and lemon harvests each totalled between 20 000 and 25 000 t in 2003-2004 and should now approach 40 000 t.

About 600 to 750 ha of land has been newly planted or replanted each year

Tunisia — Citrus — 2007-2008 export forecasts

000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Maltese	16	16	0%	18	- 10%

Source: CLAM



Ailimpo
ASOCIACIÓN INTERPROFESIONAL DE LIMÓN Y POMELO

C/. Villaleal, 3
30001 MURCIA (Spain)
Telf.: (+34) 968 21 66 19
Fax: (+34) 968 22 09 47
informacion@ailimpo.com

www.ailimpo.com





Maroc Fruit Board



Nous réunissons le meilleur du
We are gathering the best of
www.marocfruitboard.com



Mfb km 5, Dar Bouazza route d'Azemmour Casablanca 20 220 Morocco
 Tel: (212) 22.91.52.42 - Fax: (212) 22.91.51.84 - e-mail: mfb@mfb.ma

Morocco — Citrus — 2007-2008 export forecasts

000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Total clementines	234	293	- 20%	237	- 1%
Mandarin/Wilking	-	-	-	1	- 100%
Ortanique	8	8	- 1%	9	- 11%
Nova	6	3	+ 84%	3	+ 86%
Others	13	12	+ 4%	9	+ 38%
Total hybrids	26	23	+ 13%	21	+ 24%
Total easy peelers	260	317	- 18%	258	+ 1%
Navel	35	23	+ 50%	26	+ 36%
Blond	27	32	- 15%	29	- 6%
Blood	40	39	+ 2%	33	+ 20%
Late	151	163	- 8%	166	- 9%
Total oranges	253	265	- 4%	254	0%
Total	513	581	- 12%	512	0%

Source: CLAM

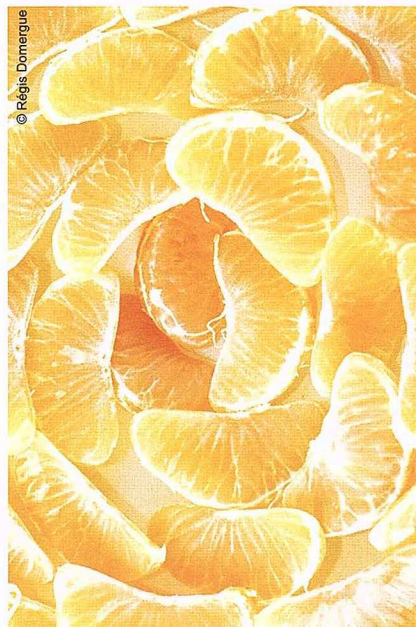
since 2003 within the framework of the national citrus programme. The orchard is therefore spreading, in particular outside the traditional Cape Bon area in the extreme north-eastern part of the country. Planting is going fast in the regions west of Tunis (Bizerte, Ariana, Beja/Jendouba and Manouba) and in the Kairouan zone further south. The programme has also made it possible to renovate the orchards to a considerable extent. As a result, 42% of the area under citrus in 2006 consisted of plantings less than ten years old against 10% in 1986. In addition, a dozen new varieties have been added to the catalogue, in particular to lengthen the marketing calendar. These fruits include early and late clementines, hybrid easy peelers such as 'Nova', early and late 'Navel' varieties, etc. The pilot nursery at Ghardi-maou provides a large proportion of the registered seedlings. Technical supervision should be enhanced with the creation of a citrus technical centre, one of whose themes will be the control of leaf miner, a pest that still strongly affects citrus productivity.

This development strategy should continue in the coming years. The aim is above all to respond to strong demand on the domestic market that is profitable as it is still closely managed and protected by high import duties. Exports should be limited once again this season to some 20 000 tonnes of 'Maltese' oranges but could increase in the medium term. The aim would be to fill the duty-free quota of 34 000 t of oranges from which Tunisian exporters benefit on the European Union market. Other markets like Russia or the neighbouring countries could subsequently be targeted.

Morocco

Production will display a conjunctural decrease in 2007-2008 and should total some 1.1 million tonnes. The decrease will be about 20% for easy peelers, with the late varieties more affected than the early

ones. The figure of - 8% suggested for orange is very much an estimate and the situation will depend greatly on the weather between now and March when



the season begins for Maroc Late, the main variety

Three main factors account for the decrease. The weather has been favourable during the key flowering and fruit setting

periods, but the drought of the preceding season lowered groundwater and reservoir levels, especially in the Souss region. Alternate bearing of 'Nour' clementine will also have a considerable impact, with 71 000 t expected against 124 000 t in 2006-2007, reducing exportable quantities to a little over 50 000 t. Finally, part of the Sodea-Sogeta orchards—currently changing hands—are temporarily not farmed.

The decrease is not the result of the renaissance experienced by Moroccan citrus growing. According to the census performed in 2006 to draw up a programme for the re-launching of the sector, 20 000 ha was replanted from 1991 to 2006 and the total area under citrus increased by 10 000 ha. Expansion seems to have accelerated in recent years, as is shown by the figures for 2006, with 3 000 ha planted or replanted in just one year! The availability in the form of a 40-year lease of part of the Sodea-Sogeta orchards is an important factor in stimulation in the medium term, as the new operators must undertake an investment and cultivation programme. Private operators (mainly Moroccan) were awarded 5 700 ha within the framework of the first stage in 2005. The second and last stage consisting of about 6 800 ha has just been awarded. Furthermore, the government also intends to play a role in stimulation by setting up a plan for the re-launching of the sector, scheduled to run from 2008 to 2012.

The increase in orchard area should benefit the zones with the best water resources and especially the Gharb, which lies roughly between Casablanca and Tangiers. Drought is the main limiting factor for the sector. The major citrus regions in the Souss and the Oriental region will benefit from a rehabilitation programme (renovation, the extension of micro-irrigation, etc.).

Easy peelers have formed the major part of the plantings in recent years and production should increase considerably, especially in the late segment. Varieties like 'Nour' or 'Nadorcott', with a harvest that should reach some 12 000 t in 2006-2007, have been widely planted in recent years. This new impetus should also make it possible to reverse the trend for recession observed in orange for the last three

Cyprus — Citrus — 2007-2008 export forecasts

000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Ortanique	29	33	- 12%	32	- 11%
Nova	1	1	0%	1	+ 8%
Others	1	1	- 8%	2	- 25%
Total easy peelers	31	35	- 12%	35	- 11%
Oval	-	-	-	1	- 100%
Late	16	15	+ 7%	24	- 34%
Total oranges	16	15	+ 7%	25	- 36%
Total lemons	4	6	- 27%	10	- 60%
Total grapefruit	21	20	+ 4%	25	- 14%
Total	72	75	- 5%	93	- 23%

Source: CLAM

CARMEL DES AGRUMES DE VALEUR

Qualité, Fraîcheur et Goût garantis



Head Office, Israel: Tel. 972-3-563-0940 • Fax. 972-3-563-0918 France: Tel. 33-1-4180-8282 • Fax. 33-1-4686-9959

Carmel[®]
AGREXCO

Israel — Citrus — 2007-2008 export forecasts

000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Ortanique	6	6	- 5%	5	+ 1%
Nova	13	16	- 17%	14	- 8%
Others	32	30	+ 5%	22	+ 45%
Total easy peelers	50	52	- 3%	41	+ 21%
Navel	2	1	+ 67%	1	+ 135%
Blond	20	17	+ 18%	22	- 10%
Late	8	4	+ 82%	8	+ 3%
Total oranges	30	23	+ 33%	31	- 3%
White grapefruit	10	10	+ 5%	11	- 11%
Coloured grapefruit/sweetie	67	75	- 11%	68	- 2%
Total grapefruits	77	85	- 9%	79	- 3%
Total lemons	2	-	-	2	- 9%
Total	159	159	0%	154	+ 3%

Source: CLAM

seasons. Here again, the late segment should be addressed with varieties such as 'Navelate' and 'Lanelate' (12 000 t expected in 2007-2008).

Another positive point is the processing sector, a key for the balance of the industry, which is increasing its capacity. The production facility in Kenitra (ex-FRUMAT) resumed production in February 2007 after being purchased by CITRUMA.

Some changes should also be seen in export trends from the 2007-2008 season onwards. Greater attention should be paid to the EU market in order to limit the over-large role now played by the Russian market, which was the destination for more than 50% of the volumes exported in 2006-2007. The currently strong euro is a further encouragement for this. Development should also be continued on distant markets—North America and perhaps Asia for the first time as a sanitary protocol is currently being signed with China and Japan. In the coming years, export dynamics will also depend on competition with the domestic market as this has displayed considerable expansion recently.

Cyprus

The trend for the scaling down of the citrus sector is confirmed in the 2007-2008 season. The harvest should total around 170 000 t. This is 30 000 t less than the volume observed at the beginning of the decade and more than 100 000 t less than the end of the 1990s. The situation is increasingly difficult in spite of varietal reconversion, in particular with the replacement of white grapefruit by coloured cultivars and the generalisation of strict quality standards (GLOBALGAP, BRC, etc.). High labour and transport costs weigh on competitiveness and are no longer compensated by government aid. In addition, the drought is tending to become more severe. Total precipitation has been less than 480 mm in the last three seasons, with a total between 360 and 410 mm in two of these years. New plantings have

been stopped and the government is thinking about a plan to save the sector.

Israel

The small dip in production expected in 2007-2008 as a result of alternate bearing of the main varietal groups—grapefruit and orange—grown in Israel does not reflect the continued strong growth of the citrus



© Régis Domergue

sector. The 620 000 t harvest expected is some 180 000 t greater than the volume produced in 2003-2004, during the worst part of slump. The rate of planting of some 600 to 700 ha per year from 2002 accelerated to 1 000 ha in 2006 and a similar figure is expected in 2007 according to USDA. A tangible sign of the regaining of confidence by citrus growers, this recovery

is related to several parameters. Firstly, the varietal restructuring of orchards (in short, less orange and white grapefruit and more late easy peelers), the decrease in grapefruit production in Florida and a favourable euro:shekel exchange rate have resulted in good returns once again, even though the last grapefruit season was disappointing. Furthermore, the crucial problem of the shortage of water for farming has been solved by recycled water, now used in 70% of the orchard area. However, shortage of labour is still a technical point for concern.

The area under 'Star Ruby' is increasing strongly, especially in the early zones in northern Israel. However, the strong decrease in the price of concentrated juice and increased competition with Turkey on the fresh fruit market could lead to a slowing of planting in coming seasons. There has also been a very strong increase in late easy peelers and of 'Or' in particular. Total production of this varietal group will reach a record 150 000 t in 2007-2008. Most of the work by the Volcani Center team that develops new varieties is based on these two families of fruits and includes in particular the breeding of sweet grapefruit.

Israeli exporters should continue to diversify their sales outlets. In 2006-2007, some 64% of shipments were reserved for the EU—in spite of an attractive exchange rate—against 75% at the beginning of the decade. The duty-free quota is considered by operators to be limiting and they are negotiating to increase it. The Russian market is the main beneficiary of this change of trend. Asia is also a target for strategic development. The phytosanitary protocol negotiated by Israel for access to the Japanese market is a favourable one (no obligatory inspection at the shipping stage). Exports of white grapefruit could therefore continue to increase. The Chinese market has been open to Israeli citrus since 2007 and may now take the first significant volumes.

Greece

With a harvest of about 1.1 million tonnes expected, production will be some 12% up

Greece — Citrus — 2007-2008 export forecasts

000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Clementine	29	28	+ 2%	25	+ 15%
Others	4	3	+ 43%	3	+ 18%
Total easy peelers	33	31	+ 6%	29	+ 16%
Navel	220	193	+ 14%	207	+ 7%
Blond	20	14	+ 40%	8	+ 143%
Late	65	48	+ 35%	40	+ 62%
Total oranges	305	255	+ 19%	255	+ 20%
Total lemons	3	1	+ 92%	6	- 59%
Total	341	288	+ 18%	290	+ 18%

Source: CLAM

on that of the last season and about 6% higher than the four-year average. This overall increase is the result of a larger orange crop. The problem of the narrow range of varieties is still topical. In spite of a conjunctural increase in the volumes of 'Valencia', production is still based to a considerable extent on 'Washington Navel'. As a result, the harvest is strongly concentrated from November to March. Some growers are therefore continuing to reduce the proportion of this variety in their orchards to the benefit of easy peelers. Nevertheless, the production of this citrus group will decrease this season and be about 5% lower than the four-year average. Supply still consists mainly of a seasonal clementine cultivar but some growers seek to lengthen the harvest period by planting early varieties ('Clemenpons', etc.) and hybrids ('Nova').

Lemon production—that exceeded 100 000 t before frost wiped out a large proportion of the orchards in 2005—will remain moderate at some 45 000 t.

Turkey

Turkish citrus production will be down by about 8% at less than 2.4 million tonnes. The fall is a break in the uninterrupted growth observed since the beginning of the decade, with the harvest increasing from 1.5 to 2.6 million tonnes in 2006-2007. The trends vary considerably from one varietal group to another. The grapefruit and orange harvest should reach record levels at 250 000 t and 1.2 million tonnes respectively. In contrast, easy peelers and lemons will suffer from alternate bearing after a large harvest in 2006-2007.

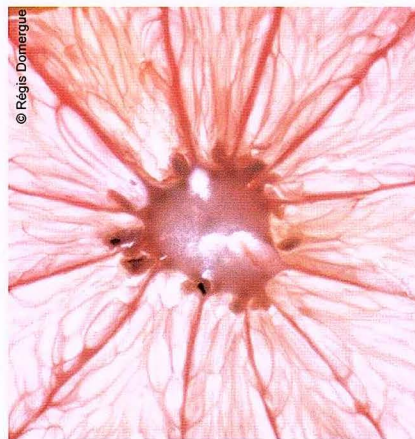
Planting seems to have slowed after the rapid rate of recent years as some growers have turned to other fruit crops such as cherry and pomegranate. But many orchards have not yet started to produce and especially those planted with easy peelers ('Nova', 'Okitsu') and early and late oranges. Some professional sources therefore count on renewed growth of production in the seasons to come. The 3-million-tonne mark could be reached in about 2010.

Turkey — Citrus — 2007-2008 export forecasts					
000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Total clementines	9	11	- 18%	8	+ 15%
Satsuma	105	147	- 29%	121	- 13%
Mandarin/Wilking	82	106	- 23%	63	+ 31%
Nova	35	42	- 17%	24	+ 49%
Others	4	6	- 27%	41	- 90%
Total hybrids	226	301	- 25%	249	- 9%
Total easy peelers	235	312	- 25%	257	- 8%
Naveline/Navel	185	144	+ 28%	124	+ 49%
Blond	5	3	+ 92%	7	- 25%
Late	54	28	+ 96%	45	+ 21%
Total oranges	245	174	+ 40%	176	+ 39%
Total lemons	250	334	- 25%	291	- 14%
Total grapefruits	185	134	+ 38%	121	+ 52%
Total	915	954	- 4%	845	+ 8%

Source: CLAM

Italy

Production should return to an average level of around 3.2 million tonnes, about 10% down on the last season. The situation is increasingly difficult in the citrus sector. The domestic market takes about half of production and is tending to shrink



as a result of increasingly keen competition from the other Mediterranean origins and Italian consumers' waning interest in citrus fruits. Efforts are nonetheless being made to make Italian production stand out. Getting on for 10 PGIs have been created since the mid-1990s: lemons from Amalfi, Sorrento, Gargano and Siracuse, blood oranges from Sicily and 'bionda' oranges

from Gargano, clementine from Calabria and the Gulf of Taranto. In addition, the processing industry, another major outlet for production that handled 1.5 million tonnes in 2006-2007 has to face the end of direct aid from the EU this season. It is true that the speciality strategy seems to have produced some results in export sales, especially of 'Tarocco' blood oranges. Penetration of the US and Japanese markets deserves congratulation. However, although volumes have been increasing in recent years, they are still limited in comparison with the quantities grown.

Corsica

Corsican citrus production will be fairly limited in 2007-2008 as winter 2007 was too warm. Shipments of clementine with leaves to mainland France, the main market for this speciality of the island, should not exceed 14 000 t. Grapefruit production should be some 3 000 to 4 000 t.

In spite of the unfavourable weather, 2007 will be remembered by producers. The efforts made in the differentiation of the specific quality of the produce have been recognised at the European level, with the establishment in February of the Protected Geographic Indication 'Clémentine de Corse'. About 70% of total production in Corsica meets the requirements of the strict standards that cover some 70 criteria. An advertising campaign is to run of French radio and television in the second half of November. Another positive feature is the increasingly better structuring and organisation of the sector. The GIE (economic interest grouping) 'Corsica Comptoir' handles the production of four packing stations and now markets about 50% of volumes on a partnership basis with supermarket chains, negotiating directly with the latter.

Much progress has thus been made since the slump caused in particular by the opening of the French market to

Italy — Citrus — 2007-2008 export forecasts

000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Clementine	48	46	+ 4%	44	+ 9%
Mandarin/Wilking	4	4	- 5%	5	- 14%
Total easy peelers	52	50	+ 4%	49	+ 7%
Navel	-	-	-	8	- 100%
Blond	-	-	-	3	- 100%
Blood	101	105	- 4%	74	+ 36%
Late	-	-	-	9	- 100%
Total oranges	101	105	- 4%	94	+ 8%
Total lemons	39	39	0%	27	+ 41%
Total	192	194	- 1%	170	+ 13%

Source: CLAM

Corsica — Citrus — 2007-2008 export forecasts

000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Clementine	14	25	- 43%	21	- 33%

Source: CLAM

clementines with leaves from other Mediterranean origins in 1994. But other subjects are still waiting for the growers, such as the rationalisation of packing facilities (more than 10 packing stations on the island!), the use of increasing amounts of sorting rejects resulting from stricter quality standards and the cost and availability of labour.

10 000 ha of new plantings in the irrigated perimeters developed in the desert over the last decade or so. Recent figures show that the rate of planting has even increased in recent seasons. Furthermore, the extension of good agricultural practices is leading to a distinct increase in yields. The export sector is controlled to a considerable degree by four large private structures and should continue to grow fast. The volumes (mainly oranges) of-

fered for sale on the international market approached 800 000 t in 2006-2007. This is 600 000 t more than at the beginning of the 2000s. It is noted that an interprofessional organisation to represent the export sector was set up this year.

Another feature is that the varietal range of easy peelers and lemons available, that still consists to a great extent of domestic cultivars, should gain diversity in the medium term. The main stakeholders in the sector aim at developing supplies of competitively priced easy peelers and lengthening the sales calendar for oranges, in particular by selling late oranges ■

Eric Imbert, Cirad
eric.imbert@cirad.fr

Egypt

Total citrus production should decrease by 10% in 2007-2008, slipping below 3 million tonnes. Orange is Egypt's speciality and the harvest should total between 1.7 and 1.8 million tonnes.

Nevertheless, this conjunctural decrease is contrary to the main trend and production should increase markedly in the medium term. The decrease in the areas under citrus in the traditional Nile Delta zone is more than compensated by the

Egypt — Citrus — 2007-2008 export forecasts

000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Mandarin/Wilking	7	7	0%	7	+ 4%
Others	-	-	0%	3	- 100%
Total easy peelers	7	7	0%	10	- 24%
Navel	398	398	0%	311	+ 28%
Blond	25	25	0%	63	- 61%
Late	336	336	0%	231	+ 46%
Total oranges	759	759	0%	604	+ 26%
Total lemons	23	23	0%	20	+ 14%
Total	789	789	0%	631	+ 25%

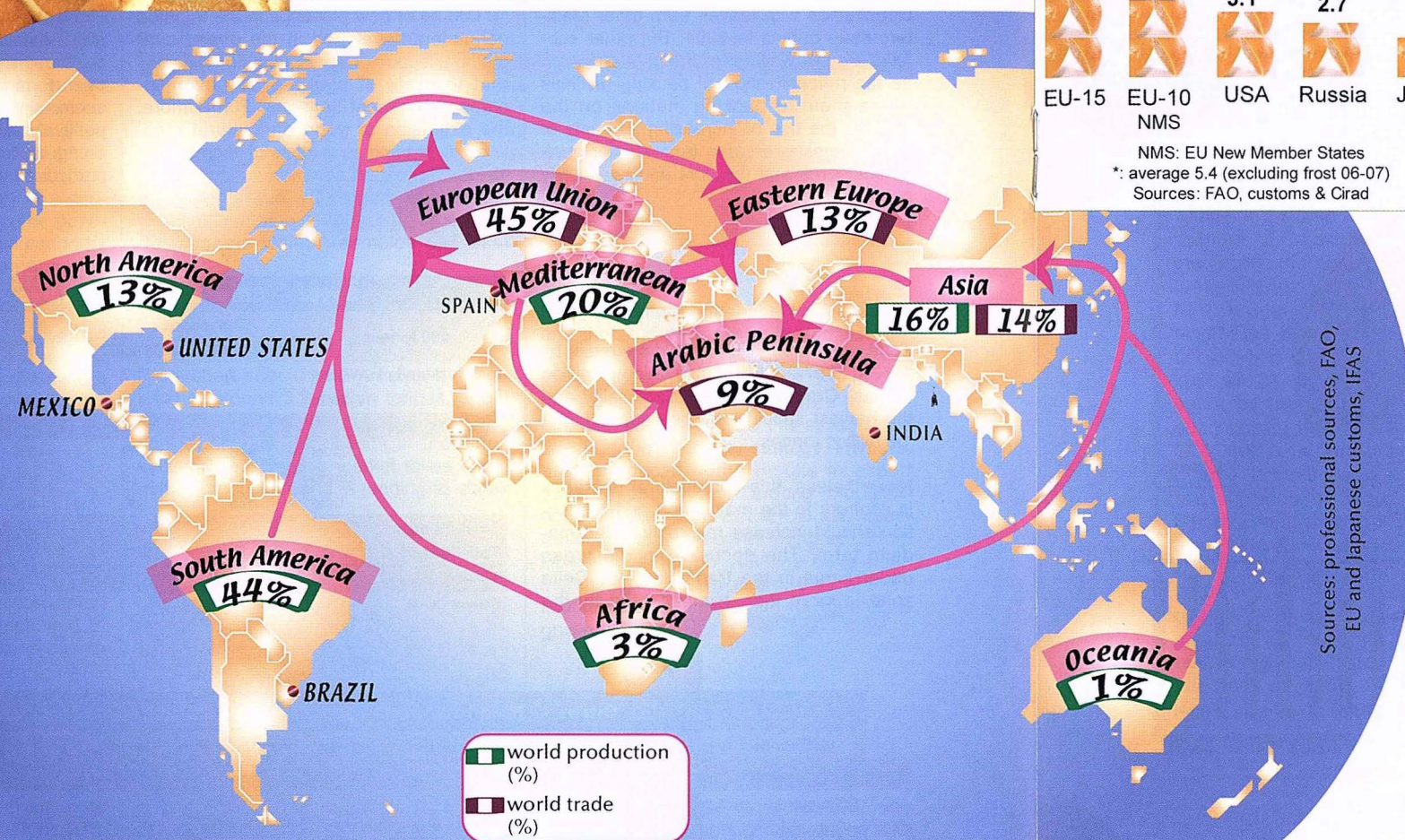
Source: CLAM

Citrus — Mediterranean region — 2007-2008 export forecasts

000 tonnes	Total	France	Spain	Morocco	Algeria	Tunisia	Italy	Israel	Cyprus	Greece	Turkey	Egypt*	Gaza*
Total easy peelers	2 118.4	14.0	1 430.0	260.0	-	-	52.0	50.0	31.0	33.0	235.0	7.4	-
Satsuma	155.0	-	50.0	-	-	-	-	-	-	-	105.0	-	-
Clementine	1 389.6	14.0	1 050.0	233.6	-	-	48.0	-	-	29.0	9.0	-	-
Mandarin/Wilking	143.4	-	50.0	-	-	-	4.0	-	-	-	82.0	7.4	-
Ortanique	42.2	-	-	8.0	-	-	-	5.5	28.7	-	-	-	-
Nova	179.9	-	125.0	5.9	-	-	-	13.0	1.0	-	35.0	-	-
Others	208.2	-	155.0	12.5	-	-	-	31.5	1.2	4.0	4.0	-	-
Total oranges	3 005.9	-	1 231.0	253.0	-	26.0	101.0	30.0	15.7	305.0	245.0	762.3	37.0
Navel/Navelina	1 344.0	-	500.0	35.0	-	4.3	-	2.0	-	220.0	185.0	397.6	-
Salustiana	142.0	-	115.0	27.0	-	-	-	-	-	-	-	-	-
Shamouti	29.0	-	-	-	-	-	-	20.0	-	-	3.0	-	6.0
Common blond	50.8	-	-	-	-	4.3	-	-	-	20.0	2.0	24.5	-
Moro-Tarocco	101.0	-	-	-	-	-	101.0	-	-	-	-	-	-
Maltese	15.9	-	-	-	-	15.9	-	-	-	-	-	-	-
Sanguinelli	-	-	-	-	-	-	-	-	-	-	-	-	-
Other blood oranges	41.0	-	-	40.0	-	-	-	-	-	-	1.0	-	-
Verna	12.0	-	12.0	-	-	-	-	-	-	-	-	-	-
Oval	9.0	-	4.0	-	-	-	-	-	-	-	5.0	-	-
Late	1 257.5	-	600.0	151.0	-	1.4	-	8.0	15.7	65.0	49.0	336.4	31.0
Bitter	3.8	-	-	-	-	-	-	-	-	-	-	3.8	-
Total grapefruits	325.9	-	37.5	-	-	-	2.5	77.0	21.2	1.5	185.0	1.2	-
White grapefruit	88.9	-	37.5	-	-	-	2.5	10.0	21.2	1.5	15.0	1.2	-
Other grapefruits	237.0	-	-	-	-	-	-	67.0	-	-	170.0	-	-
Total lemons	768.2	-	445.0	1.6	-	-	38.5	2.0	4.0	2.5	250.0	22.9	1.7
Other citrus	7.0	-	-	-	-	-	-	7.0	-	-	-	-	-
Total	6 225.4	14	3 143.5	514.6	-	26.0	194.0	166.0	71.9	342.0	915.0	793.8	38.7

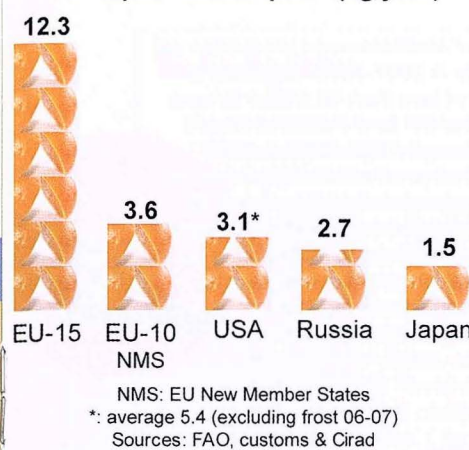
* estimates / Source: CLAM

Oranges... production 60 million tonnes
and international trade 5.4 million tonnes



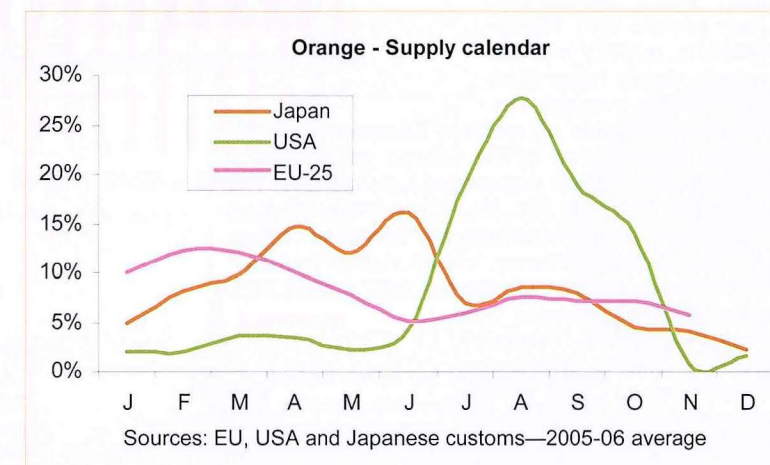
Orange

Per capita consumption (kg/year)



Orange World production		Orange World exports		Orange World imports	
2006-2007	000 tonnes	2006-2007	000 tonnes	2006-2007	000 tonnes
World	60 421	World	5 370	World	5 370
Brazil	18 523	Spain	1 452	UE to 25	2 317
United States	7 589	South Africa	900	Russia	391
Mexico	4 113	Egypt	762	Saudi Arabia	319
Spain	3 396	United States	546	China	236
India	3 100	Morocco	264	Canada	225
China	2 412	Greece	255	Korea	123
Italy	2 356	Turkey	174	Japan	121
Egypt	1 939	Argentina	165	United States	112
Iran	1 900	Italy	105	Ukraine	93
Pakistan	1 580	Uruguay	87	Malaysia	86
Indonesia	1 312	China	91	Romania	81
South Africa	993	Australia	75	Switzerland	59
Turkey	975	Zimbabwe	44	Turkey	54
Greece	855	Honduras	44	United Arab Em.	53
Argentina	770	Lebanon	44	Guatemala	43

Sources: EU, USA and Japanese customs, FAO, Cirad



Orange — United States imports and production

tonnes	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Imports	39 961	101 923	48 885	52 785	56 789	55 590	58 042	69 986	73 842	112 108
South Africa	375	321	9 647	15 551	13 577	23 726	25 835	23 270	37 511	30 750
Spain	1 441	16 769	1 974	143	-	-	21	12	2	22 920
Australia	25 940	22 258	23 923	16 277	20 189	20 243	18 397	30 993	22 756	22 661
Mexico	8 030	50 683	8 373	14 438	17 469	6 509	8 796	13 039	10 994	19 241
Italy	186	170	221	538	226	287	154	1 226	740	6 176
Others	3 989	11 722	4 748	5 839	5 329	4 825	4 840	1 446	1 838	10 360
Production	13 670 000	9 824 000	12 997 000	12 221 000	12 374 000	11 545 000	12 872 000	9 252 000	8 898 000	7 589 000
Florida	79.0%	80.0%	85.0%	80.0%	82.0%	84.0%	79.0%	85.0%	73.0%	74.0%
California	20.0%	19.0%	14.0%	19.0%	17.0%	16.0%	20.0%	15.0%	26.0%	25.0%
Texas	0.0%	0.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Arizona	0.3%	0.3%	0.4%	0.3%	0.3%	0.2%	0.2%	0.1%	0.2%	0.2%
Industry	81.0%	87.0%	83.0%	82.0%	83.0%	79.0%	83.0%	76.0%	78.0%	82.0%

Source: US customs (code 080510), USDA

Orange — Japanese imports and production

tonnes	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Imports	154 086	171 269	150 470	89 703	136 150	126 203	103 873	117 087	112 937	115 433	120 875
United States	135 683	147 624	131 866	46 204	116 951	104 152	79 611	88 068	85 524	84 629	88 179
Australia	11 960	8 385	7 357	12 460	6 245	7 238	8 765	9 238	6 493	8 443	15 522
Chile	38	87	25	539	1 153	3 680	4 958	6 120	10 408	11 382	9 440
South Africa	5 905	14 161	9 210	13 846	8 547	9 337	8 028	13 276	10 216	10 960	7 714
Italy	-	-	-	-	-	-	-	-	-	-	19
Others	502	1 012	2 011	16 515	3 236	1 796	2 510	385	295	19	1
Production	124 000	134 000	124 000	111 000	104 000	104 400	98 500	89 800	88 800	74 700	74 700

Source: Japanese customs (code 080510000), FAO

Orange

EU imports by entry point

Poland	1%	3%
Italy	2%	4%
Spain	1%	5%
Belgium	10%	6%
UK	15%	15%
France	21%	16%
Netherlands	17%	18%
Germany	25%	21%

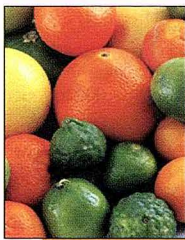
1995-1996 2005-2006

Source: Eurostat

Orange — EU-25 imports and production

tonnes	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Total	2 056 759	2 140 635	2 027 699	2 195 103	1 981 617	2 343 122	2 146 708	2 295 781	2 108 853	2 292 077	2 317 629
Total northern hemisphere*	1 631 588	1 723 499	1 557 528	1 711 280	1 558 010	1 741 783	1 710 266	1 797 095	1 637 799	1 736 457	1 798 693
Spain	1 022 906	1 171 417	1 045 191	1 229 520	1 035 743	1 318 246	1 307 476	1 384 730	1 125 862	1 222 191	1 332 066
Morocco	228 821	211 683	194 505	168 961	167 012	132 288	163 429	135 149	132 382	140 634	97 147
Greece	65 730	61 641	78 247	65 696	87 780	52 043	35 142	47 256	80 898	108 123	101 424
Egypt	9 618	8 714	8 018	10 740	14 884	26 278	32 013	56 886	103 472	95 135	107 675
Italy	78 762	90 462	63 001	91 113	94 750	78 727	53 253	60 102	67 514	72 798	68 952
Portugal	1 549	249	549	544	779	1 534	463	1 393	7 837	20 897	20 516
Israel	114 607	94 774	70 444	54 592	54 257	30 775	23 586	23 343	27 641	18 937	21 584
Tunisia	14 629	22 876	20 834	24 349	21 377	21 539	16 992	18 545	18 212	18 843	16 458
Turkey	21 243	7 134	13 538	10 125	16 238	21 562	18 189	14 541	30 598	13 878	8 991
Cyprus	18 549	18 549	18 528	18 507	18 269	16 940	16 698	16 953	10 982	7 454	7 634
Others	55 174	36 001	44 674	37 134	46 921	41 853	43 025	38 198	32 403	17 568	16 246
Total southern hemisphere	425 172	417 136	470 171	483 822	423 607	601 339	436 442	498 687	471 054	555 620	518 936
South Africa	228 358	205 917	270 758	265 228	272 092	312 701	280 941	294 772	256 234	337 210	288 663
Argentina	73 438	74 705	72 957	53 324	31 454	81 157	59 659	64 207	78 022	74 053	80 093
Uruguay	37 175	46 350	49 698	51 623	25 518	48 520	38 664	55 325	51 776	74 956	64 847
Brazil	71 752	67 407	49 944	86 178	63 325	116 608	23 377	48 956	50 076	20 177	47 601
Zimbabwe	13 069	21 528	24 972	24 651	28 039	39 576	32 034	31 968	13 628	10 355	13 642
Chile	86	28	45	193	257	905	723	1 861	16 187	30 133	12 972
Australia	374	774	1 571	1 414	2 311	1 440	1 045	1 597	4 018	4 426	10 079
Others	921	427	226	1 212	612	433	-	-	1 113	4 311	1 041

* Extra-EU imports and EU production (Spain, Italy, Greece, Cyprus, Portugal) / Note: EU-15 from 1995 to 2003, then EU-25 since 2004 / Source: Eurostat



2007-2008 citrus season forecasts

Details by fruit category

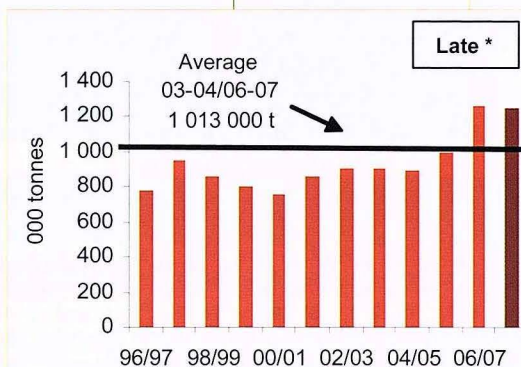
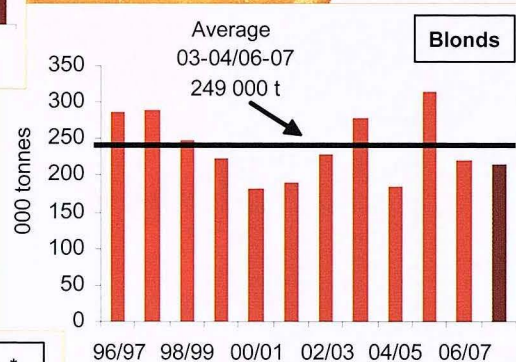
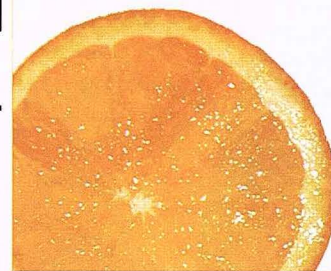
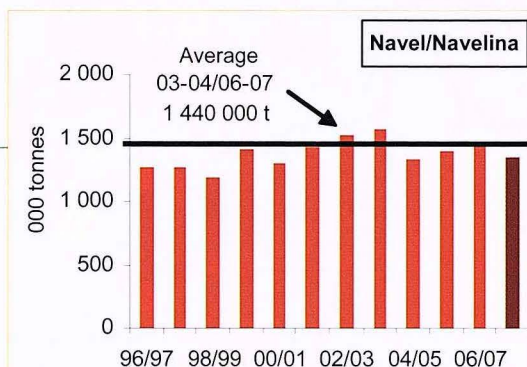
Photos © Régis Domergue

Growth of Mediterranean production will mark time in 2007-2008. Expected to weigh in at less than 18 million tonnes, the harvest will be 2 million tonnes smaller than the record set in 2006-2007. However, it will be fairly close to the four-year average. Supply will be particularly short in the season's easy peelers, lemons (especially during the last part of the season) and juice and dessert oranges during the autumn and the first part of the winter.

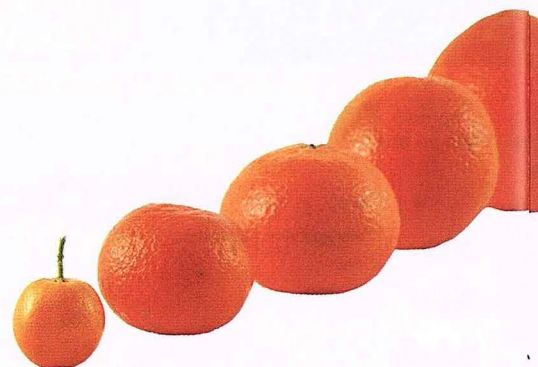
Orange

Exports should be about 4% smaller than during the last, record season (for easy peelers too). Nevertheless, supply should remain slightly larger than the four-year average. The volumes available on western European markets during the first part of the season will display a marked deficit in both dessert and juice oranges. The Spanish harvest of 'Naveline'/'Navel' and 'Salustiana'—varieties forming the backbone of supply until January-February, will be distinctly smaller than average (-10%). On the speciality market, supplies of blood oranges from Italy ('Moro' and 'Tarocco'), Morocco (mainly 'Washington' blood orange) and Tunisia ('Maltese') will be slightly larger than average. Volumes should return to normal in the second part of the season. However, although supplies of late oranges from Spain ('Lanelate', 'Navelate', etc.) will continue to gain momentum, those of juice oranges will be fairly light as a result of a 'Valencia' harvest shortfall in Spain and Morocco.

The opposite scenario will be seen on the eastern European markets. Supply should be slightly larger during the first part of the season. The decrease in the 'Navel' harvest in Egypt will be more than counter-balanced by the increase in the production of this variety in Turkey and Greece. In contrast, a supply deficit should be observed at the end of the season as the larger 'Valencia' harvest in Greece will not make up for smaller production in Egypt and Morocco.



* Valencia and late table oranges



Orange - Mediterranean region - 2007-2008 export forecasts

000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Navel/Navelina	1 344	1 445	- 7%	1 440	- 7%
Blond	216	219	- 2%	249	- 13%
Blood	170	180	- 5%	137	+ 24%
Late	1 247	1 261	- 1%	1 013	+ 23%
Total	2 965	3 090	- 4%	2 830	+ 5%

Source: CLAM

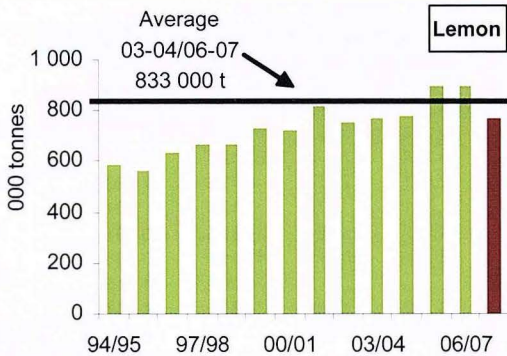
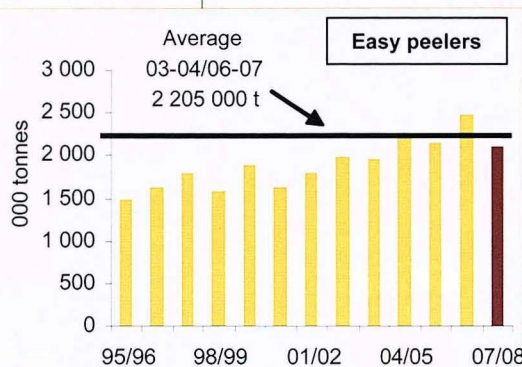
Easy peelers

Export forecasts are 15% down on the record 2006-2007 figures and are well below the average. The deficit was eased in October by the increase in shipments of early clementines from Spain but will worsen distinctly in the heart of the season. The Moroccan 'Fine' season is at a fairly good level but the harvests of 'Nules' and 'Clemenvilla' in Spain, a substantial part of market supply in November and December, are well down. The complement shipped by Israel and Turkey ('Nova'/'Suntina', 'Minneola') will be larger than average but the volumes of Corsican clementines available on the French market will be fairly limited. Supply will also be fairly moderate at the beginning of the year. The structural decrease in the 'Fortuna' harvest will be partially compensated by the increase in the quantities of high-quality cultivars such as 'Nadorcott' in Spain. However, only moderate supplies of 'Nour' from Morocco and medium quantities of 'Hernandina' from Spain will be available. Among late fruits, the 'Or' harvest will be quite large in Israel but will not make up for the structural decrease in the quantities of 'Ortanique' in most Mediterranean countries (in Morocco, Spain and, to a lesser degree, in Cyprus).

Easy peelers - Mediterranean region - 2007-2008 export forecasts

000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Clementine	1 384	1 599	- 13%	1 398	- 1%
Satsuma	155	226	- 31%	217	- 29%
Mandarin/Wilking	143	227	- 37%	189	- 24%
Ortanique	42	47	- 9%	46	- 9%
Nova	180	200	- 10%	179	0%
Others	208	188	+ 11%	176	+ 18%
Total	2 112	2 485	- 15%	2 205	- 4%

Source: CLAM



Lemon

A marked deficit will be seen on both the western and eastern European markets as the Spanish and Turkish harvests will be more than 20% below the three-year average. Supply will be particularly limited during the second part of the season as Spanish production of 'Verna' is particularly small.

Lemon - Mediterranean region - 2007-2008 export forecasts

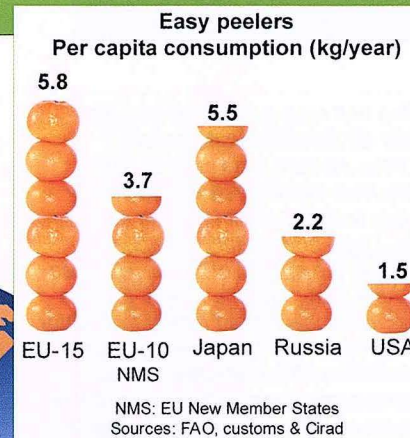
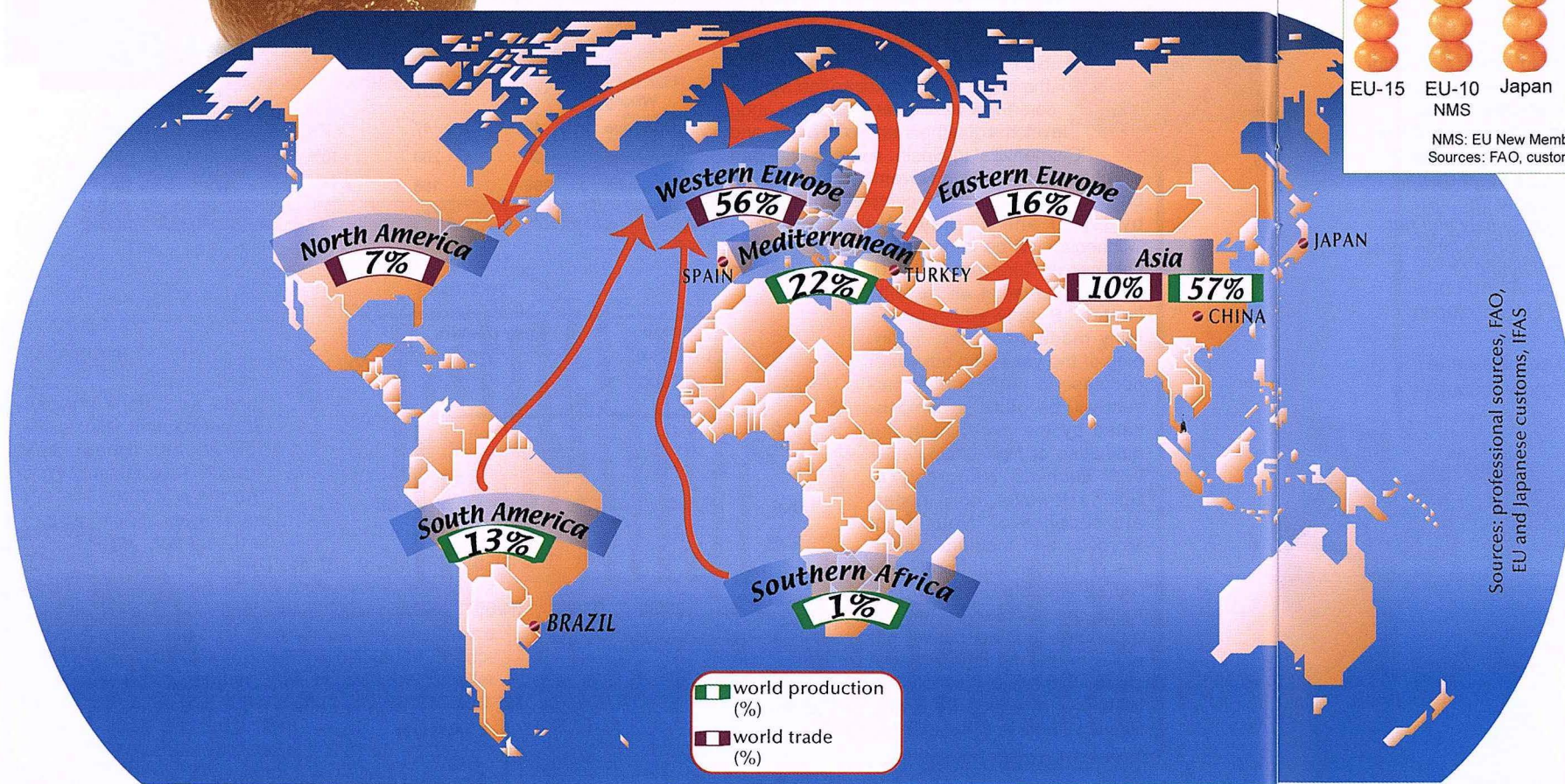
000 tonnes	Seasons		Evolution	4 last seasons average	2007-2008 / average
	2007-2008	2006-2007			
Spain	445	497	- 10%	479	- 7%
Cyprus	4	6	- 27%	10	- 60%
Turkey	250	328	- 24%	291	- 14%
Greece	3	1	+ 92%	6	- 59%
Italy	39	39	0%	27	+ 41%
Egypt	23	23	0%	20	+ 14%
Total	763	894	- 15%	833	- 8%

Source: CLAM

Grapefruit

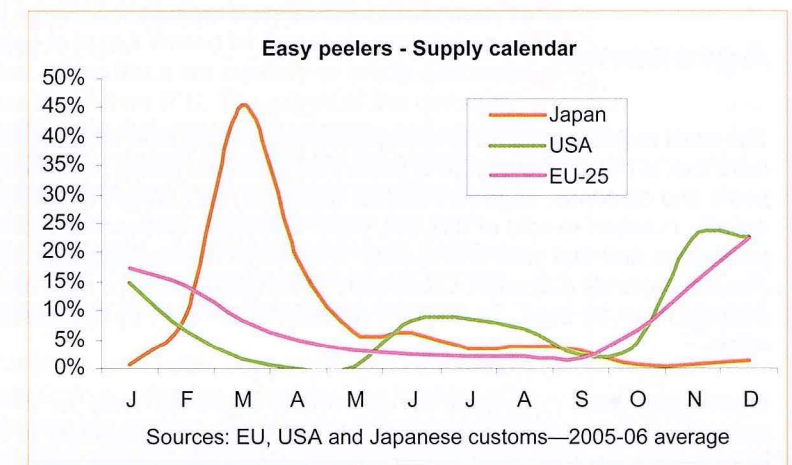
Supply of Mediterranean grapefruit should be fairly substantial, especially as regards small fruits. Israeli production is average but the harvest will be of historic proportions in Turkey. The complement from Spain and Cyprus will be similar in volume to that of the last season. Shipments from Florida may dip in comparison with those of 2006-2007 as there is a slight production deficit and the season has started late because of the small size of the fruits at the beginning of the season. Shaddock from China and grapefruit from Central America may play a significant role, as they did last year.

Easy peelers... production 24.5 million tonnes
and international trade 3.3 million tonnes



Easy peelers World production		Easy peelers World exports		Easy peelers World imports	
2006-2007	000 tonnes	2006-2007	000 tonnes	2006-2007	000 tonnes
World	24 479	World	3 316	World	3 316
China	11 395	Spain	1 656	EU-25	1 766
Spain	2 501	China	367	Russia	313
Brazil	1 233	Morocco	317	Vietnam	114
Japan	1 132	Turkey	312	Canada	108
Turkey	628	South Africa	100	United States	107
Iran	702	Argentina	99	Ukraine	98
Thailand	670	Pakistan	55	Malaysia	64
Egypt	712	Israel	51	Indonesia	60
Argentina	660	Italy	50	Philippines	56
Pakistan	639	Uruguay	38	Saudi Arabia	52
Korea	638	Cyprus	35	Switzerland	40
Italy	590	Greece	31	China	32
Morocco	535	Peru	29	Romania	33
Mexico	403	Australia	21	Norway	26
United States	358	Iran	21	Byelorussia	17

Sources: EU, USA and Japanese customs, FAO, Cirad

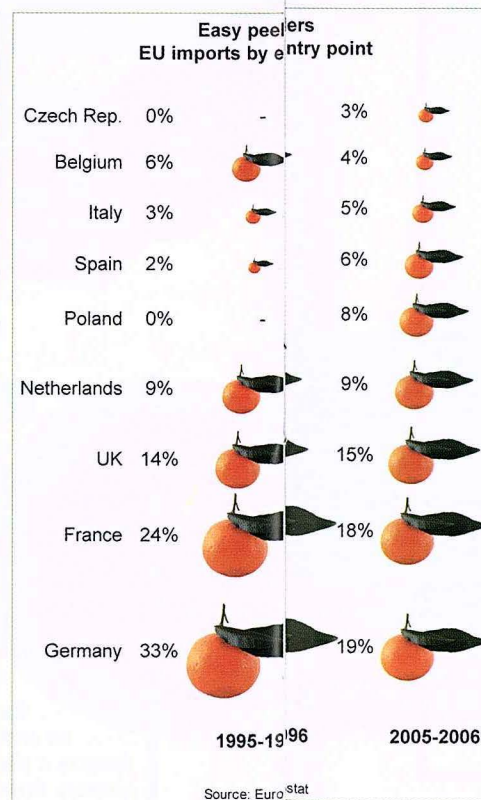


Easy peelers — United States imports and production — September to August period										
tonnes	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Total import	41 025	55 865	93 926	92 947	63 630	85 893	90 567	93 407	102 942	122 051
Mediterranean, incl.	33 103	48 549	81 373	79 321	50 368	68 586	72 275	65 223	67 088	81 660
Spain	32 476	46 991	78 429	78 502	45 689	54 017	69 234	62 471	63 129	74 006
Morocco	415	1 275	2 428	529	3 584	13 026	2 521	2 374	3 770	7 423
Others	212	283	516	290	1 096	1 544	521	378	190	231
Others, incl.	7 922	7 315	12 554	13 626	13 261	17 307	18 292	28 184	35 853	40 391
South Africa	187	361	1 524	3 426	4 636	4 651	8 770	10 899	11 156	13 796
Chile	-	21	68	-	-	-	-	2	8 009	11 846
Australia	1 146	1 948	2 489	2 301	4 086	2 774	3 162	4 096	4 838	4 447
Mexico	4 198	2 864	3 955	4 333	3 903	3 665	3 185	4 351	4 128	4 222
Peru	-	-	-	-	-	-	-	-	-	1 891
Total production*	442 460	400 734	505 427	423 997	468 116	442 815	419 268	367 301	435 353	358 124
Florida	340 400	317 385	391 460	327 040	372 180	332 930	320 950	255 035	294 170	249 260
Arizona	20 412	32 319	28 917	22 113	21 092	14 629	23 474	13 608	18 711	10 206
California	81 648	51 030	85 050	74 844	74 844	95 256	74 844	98 658	122 472	98 658

* tangerine and tangelo / Source: US customs, code 080520

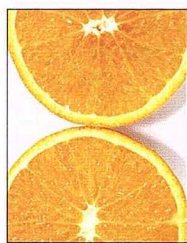
Easy peelers — Japanese imports and production											
tonnes	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Total, incl.	3 711	6 532	8 611	7 939	10 556	12 088	9 870	9 657	11 659	10 827	10 554
United States	3 239	5 253	4 521	2 312	5 042	4 910	5 252	6 477	8 434	7 977	8 606
Taiwan	78	107	93	87	92	56	58	54	71	75	91
New Zealand	321	178	789	1 316	923	766	834	885	879	593	358
Chile	22	899	1 488	1 493	982	2 025	2 458	1 096	921	1 429	444
Korea	46	95	1 710	1 034	2 006	2 561	334	135	229	87	26
Australia	-	-	-	1 688	1 510	1 758	935	1 010	1 119	612	1 028
Others	3	-	11	8	-	10	-	-	5	54	-
Production	1 153 000	1 555 000	1 194 000	1 447 000	1 143 000	1 282 000	1 131 000	1 146 000	1 060 000	1 132 000	841 900

Source: Japanese customs (code 08052000), FAO



Easy peelers — EU-25 imports and production										
tonnes	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Total global	1 326 625	1 216 358	1 240 753	1 159 382	1 249 706	1 347 258	1 398 219	1 735 486	1 681 533	1 766 599
Total northern hemisphere*	1 251 832	1 125 824	1 148 905	1 083 410	1 133 173	1 235 854	1 277 768	1 592 839	1 532 758	1 601 848
Spain	1 052 699	913 722	905 480	888 677	900 665	1 058 960	1 083 608	1 318 012	1 257 849	1 372 793
Morocco	109 820	111 575	122 384	62 298	91 272	80 370	96 213	114 132	93 750	82 503
Italy	13 401	8 680	30 469	20 871	16 847	11 016	7 487	39 521	72 795	50 147
Turkey	32 103	49 709	43 301	56 397	70 113	55 540	37 094	57 736	42 112	42 396
Israel	24 639	19 134	24 442	30 530	22 554	-	20 993	16 307	13 566	15 535
Cyprus	8 602	12 167	15 266	13 754	19 643	16 566	18 058	20 353	19 645	12 136
Greece	5 804	8 858	5 272	8 946	8 744	10 513	9 175	9 890	14 940	11 332
Croatia	-	-	0	-	173	-	-	6 524	1 054	7 413
Portugal	109	113	85	223	851	375	2 052	5 334	9 040	2 785
Egypt	559	274	660	555	505	1 031	933	2 861	2 948	2 221
Pakistan	813	287	543	339	789	502	1 038	1 557	3 606	1 591
Jamaica	1 160	967	750	693	705	690	638	157	343	357
China	-	-	-	0	4	-	19	106	213	270
Belize	-	-	-	-	-	-	-	-	-	214
Others	2 124	339	253	125	308	291	460	350	896	165
Total southern hemisphere	74 794	90 534	91 848	75 972	116 534	111 404	120 451	142 647	148 776	164 751
South Africa	26 902	34 181	45 990	35 142	58 256	46 441	49 732	53 378	52 683	53 456
Argentina	23 855	22 072	20 569	16 408	20 618	27 452	22 656	33 023	26 403	38 526
Uruguay	19 255	28 091	19 443	15 203	24 594	18 562	27 089	23 548	33 519	36 121
Peru	391	21	377	752	4 743	8 639	9 154	16 611	24 924	25 723
Chile	366	2 117	2 498	4 305	5 102	7 389	7 825	10 925	6 770	7 528
Brazil	3 390	2 411	1 979	3 291	2 298	2 052	2 505	2 584	3 288	2 055
Australia	-	34	-	111	23	224	778	756	456	710
Swaziland	619	1 606	992	760	900	609	698	862	407	439
New Zealand	15	-	-	-	-	36	13	-	-	130
Zimbabwe	-	-	-	-	-	-	-	959	326	62

* Extra-EU imports and EU production (Spain, Italy, Greece, Cyprus, Portugal) / Note: EU-15 from 1995 to 2003, then EU-25 since 2004 / Source: Eurostat



Citrus cultivation

Henri Vannière

our era. New citrus fruits such as sweet oranges were introduced around the Mediterranean basin in the sixteenth century thanks to Portuguese navigators and the possibility of direct maritime trade with the Far East and China. These species were then disseminated in Africa and America. The first mandarins were introduced in the Mediterranean region much later. The fruit is mentioned at the beginning of the nineteenth century in Italy and not until 1850 in North Africa. However, the Mediterranean has been an important diversification zone for the three most important economic species—orange, mandarin and lemon. The grapefruit, *C. paradisi*, a natural hybrid of shaddock, is one of the rare commercial citrus fruits to have originated in the Caribbean.

The world's leading fruit crop grown between the latitudes 40° N and 40° S, citrus fruits were domesticated in Asia. Ancient texts refer to sour citrus fruits in India from 800 BC onwards, and mandarins, oranges and grapefruit in China at the time of Confucius. Trade and military conquests contributed strongly to the spread of citrus. This was first overland via Asia Minor and the Middle East as Roman and Greek influence spread (citron fruit, bitter orange) and then through Islam and the Crusades (sour citrus). The citron fruit was the first species grown in the Mediterranean several centuries before

Agronomy

The most suitable soils for growing citrus are slightly acid and well-filtering. The choice of rootstock is one of the essential factors for success, giving tolerance or resistance to biotic (soil pests and diseases, degeneration diseases) and abiotic constraints (acid or alkaline soils, salinity, reaction to cold or drought, etc.). It strongly influences factors such as vigour, the start of production and fruit yield and quality. The risk of contamination by tristeza has led to favouring *Poncirus* hybrids (Citrange, Citrumelo) as a replacement for sour orange. Disease-free plant material must be used. Today, new rootstocks are bred by hybridisation or the use of biotechnologies.

Certification plans have been set up in many countries. They combine the use of healthy plant material and prevention of possible recontamination by inoculum or a disease spread by an insect vector by siting outdoor nurseries in clean zones or by sheltered production in risk zones. The rootstocks are sown, replanted and then shield budded or chip budded, using a bud from a shoot of the desired variety.

It is recommended that the base of the trunk should be set in a slightly raised position at planting to limit attacks by *Phytophthora*. Tillage is reduced after planting so as not to damage the surface roots. The base of the trunk must be weeded. The maintenance technique used (permanent plant cover, chemical or mechanical weed control) depends on soil/climate and economic constraints.

Preliminary pruning is performed in the early years. Annual maintenance pruning then balances and aerates the foliage and ensures the renewal of fruit-bearing shoots. Irrigation is essential in dry areas and can be in the form of subfoliar sprinkling or trickle irrigation (soakers, drip, etc.). Fertilisation can be combined with irrigation in this case (fertigation) to save inputs and ensure steady mineral nutrition.

Mineral fertilisation must make up for exports in fruits and prunings and ensure the growth of the vegetative organs. Fertilisation includes nitrogen, phosphorus and potassium. Trace elements are sprayed on the foliage. Fertilisation is based on the results of mineral analyses of leaves and soil.

Among growth regulators, gibberellic acid improves the setting of clementines and synthetic auxins increase fruit grade.



© Régis Domergue



The influence of climatic conditions

Citrus originated in south-east Asia. The climate there is equatorial, tropical or subtropical according to the latitude and always strongly marked by a monsoon regime. The year features a hot, humid season (the monsoon season) and a fairly rain-free, often cooler season. The developmental cycle of citrus is keyed into these seasons. The hot, humid period is one of intense physiological activity, with shoot and fruit growth. Vegetative growth halts in the cool, dry period, a feature all the more marked when drought is severe or temperatures low. A marked halting of vegetative growth is essential before any flowering of certain citrus such as mandarin, orange, grapefruit and shaddock. Others with repeat-flowering such as citron, lemon and lime have less strict requirements but react to the same phenomena.

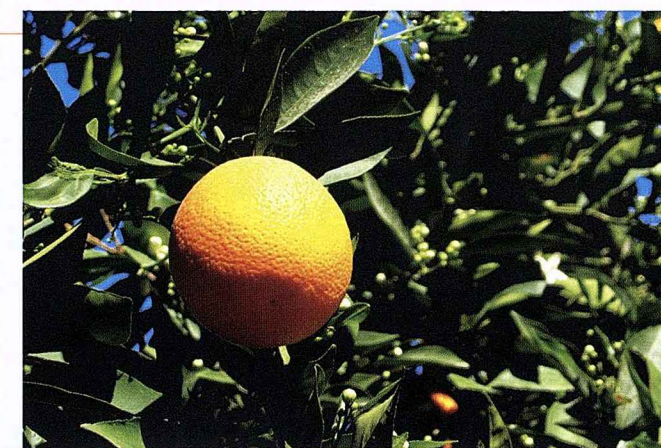
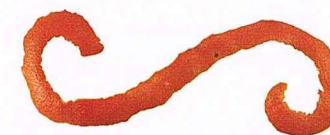
Temperatures between 21 and 30°C are optimum for physiological activity. This is strongly reduced when the temperature is lastingly and significantly higher than 35°C or lower than 13°C.

Citrus growing is in fact limited by threshold and ceiling temperatures. Citrus trees are partially or totally destroyed at temperatures lower than 0°C. The extent of the damage depends firstly on frost duration and intensity and secondly on the susceptibility of plant parts and the type of citrus. Thus flowers, young leaves and fruits are more sensitive than branches and trunks. Citron, lime and lemon are more sensitive than mandarin, orange and grapefruit. Temperatures lower than -7°C are generally lethal for citrus trees. Temperatures higher than 50°C also cause damage.

Strong insolation is also better supported when the water supply is satisfactory. Irrigation must be used in citrus growing in arid or very dry regions. Plant water requirements are directly correlated with the climatic parameter total radiation (the main feature) related to insolation, temperature, wind, relative humidity, etc. These parameters are used in water requirement models and irrigation management tools.

Temperature plays an important role in the changes of fruit pigmentation as maturity approaches. Temperatures lower than 15°C cause the disappearance of chlorophyll pigments from the epidermis. This reveals carotenoid pigments. The synthesis of carotenoids (yellow and orange) and lycopene (red, specific to shaddock and grapefruit) is enhanced by a temperature of between 15 and 35°C. Red anthocyanin pigments (blood oranges) require lower temperature but still higher than 12°C.

The synthesis and senescence of the various pigments are thus strongly affected by ambient temperature. In the tropics, the absence of low temperatures means that chlorophyll pigments do not disappear and the fruits remain green. Anthocyanin synthesis does not take place for the same reason and blood oranges remain blond. In contrast, the red pigmentation of grapefruit is more intense. The alternate high daytime temperatures and cool nights in Mediterranean zones create an optimum environment for the breakdown of green chlorophyll pigments and the synthesis of the yellow, orange and red pigments of the various types of orange, mandarin and lemon. The external colour of the fruits is thus very well expressed.



© Eric Imbert



Citrus pests and diseases

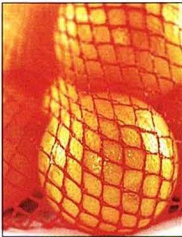
Pests and diseases are numerous and can have serious economic impacts, possibly requiring quarantine (material subject to regulations concerning movement) and the forbidding of exports to other production zones to avoid the spread of harmful organisms. The use of tolerant rootstocks is an effective measure in the control of several organisms but the choice of variety is often dictated by the market. In addition to the production of healthy plant material, the control of these pests and diseases generally combines genetic, biological and chemical components in an integrated control framework.



Citrus diseases	Tristeza Virus: Citrus Tristeza Closterovirus	Huanglongbing (greening) Phloem bacteria: <i>Liberibacter africanum</i> , <i>L. asiaticum</i>	Citrus canker Bacterium: <i>Xanthomonas axonopodis</i> pv. <i>citri</i>
Distribution	All regions except some Mediterranean countries.	Asia, subtropical and tropical Africa, Middle East.	Asia, South America, Florida, certain regions of Africa.
Symptoms	Dieback of varieties grafted on sour orange (except lemon trees), vein clearing and stem pitting.	Shoot yellowing, leaf mottling, small poorly coloured fruits.	Corky pustules on leaves and fruits.
Susceptible species	Lime, orange and grapefruit trees.	Broad host spectrum. Affects orange and mandarin above all.	Broad host spectrum. Above all grapefruit, orange, lime and some mandarins.
Transmission	Aphids (<i>Aphis gossypii</i> , <i>Toxoptera citricida</i>).	Psyllas (<i>Diaphorina citri</i> , <i>Trysoza erytrae</i>)	By air and water.
Economic impact	Loss of trees and decreased production.	Tree dieback, shorter orchard life.	Harvest loss.
Quarantine organism	Present in the EU.	Not present in the EU.	Not present in the EU.



Citrus pests	Fruitfly Diptera Tephritidae: various species of the genera <i>Ceratitis</i> , <i>Anastrepha</i> , <i>Dacus</i> , <i>Bactrocera</i> , etc.	Thrips Thysanoptera: thripidae. <i>Scirtothrips</i> spp. (<i>S. aurantii</i> , <i>S. citri</i> , <i>S. dorsalis</i>)	Diaspine Hemiptera: Diaspididae. Genera <i>Aonidiella</i> , <i>Unaspis</i> , <i>Chrysomphalus</i> , <i>Cornuaspis</i> , etc.
Distribution	American continent: <i>Anastrepha</i> . Africa: <i>Ceratitis</i> , <i>Dacus</i> . Asia-Pacific: <i>Bactrocera</i> .	Variable according to the species. Present in the Mediterranean area: <i>Tetranychus urticae</i> , <i>Panonychus citri</i> .	Variable according to the species. Present in the Mediterranean area: <i>Aonidiella aurantii</i> , <i>Cornuaspis beckii</i> , etc.
Symptoms	Pricking caused by females laying eggs in the fruits.	Greyish patches in a ring around the fruit stalk (thrips feeding on young fruits).	Scale on leaves, shoots and/or fruits, trees weakened in case of large populations.
Susceptible species	Mandarin, orange, grapefruit. Mandarins and thin-skinned oranges susceptible.	Orange, mandarin, tangor, tangelo, lemon, etc.	Broad host spectrum.
Economic impact	Harvest loss.	Deterioration of the outside appearance of fruits.	Deterioration of the outside appearance of fruits.
Quarantine organism	Not present in the EU.	Not present in the EU.	Not present in the EU.



Citrus harvesting and storage

Citrus fruits are not climacteric and their quality does not therefore improve after harvesting. Suitable storage can slow their evolution: an appropriate positive temperature, 85 to 90% relative humidity and ventilation. Fruits must be harvested at a stage of maturation close to optimum ripeness—and hence optimum quality. Quality is characterised mainly by the juice content, the dry extract/acidity ratio and flavour. Fruits must be handled with care during the harvest and not be wetted, so as to limit subsequent risks of physiological deterioration or the entry of pathogens. Transport to the packing stations must be carried out as soon as possible.

Degreening and storage

As fruits approach the ripe stage, green chlorophyll pigments disappear gradually, revealing the other yellow, orange and red epidermis pigments. This change requires cool temperatures lower than 13°C. These temperature conditions are not found in the tropics or in a Mediterranean climate in early autumn when the early varieties are picked. The fruits therefore remain green or are poorly coloured. Degreening is possible if significant breakdown of chlorophyll pigments has started naturally. Degreening is performed by placing the fruits in a chamber with a controlled atmosphere containing 1.0 to 5.0 ppm ethylene. The temperature is set at 22 to 25°C for oranges, and at a lower temperature for lemons, with relative humidity of 85 to 90%. The technique reduces storage time since ethylene stimulates senescence in citrus fruits. The duration of chilled storage can be lengthened by the application of wax or a stretch film reducing respiratory exchange and water loss. In contrast, controlled atmospheres have little or no effect.

Physiological deterioration

This is caused mainly by impacts in the orchard that are revealed later or during storage.

Frost: in the orchard or after the harvest. The skin looks wet and translucent and the segments dry out.

Chilling injury: exposure to temperatures that are above freezing point but lower than the optimum storage temperature.

They cause the bursting of the essential oil glands, resulting in the burning of tissue and the appearance of small sunken brown spots on the peel; these may become coalescent. Fungal damage may subsequently occur.

Oleocellosis: caused by temperature variations in the field or bruising during harvesting or storage. Symptoms are very similar to those of chilling injury.

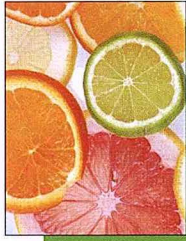
Abrasion by brushing: caused by skin fragility, the use of brushes that are too hard or by too high a brushing speed. The upper layers of the skin are eroded, resulting in dry patches of varying width and flow of essential oil that burns the tissue.

Fungal damage

More than 75% of postharvest citrus rots are caused by two *Penicillium* moulds (*P. italicum* and *P. digitatum*). Some rots should not appear during storage if harvesting is performed carefully:

- bitter rot caused by *Geotrichum candidum* affects fallen fruits or fruits soiled with earth;
- *Cladosporium herbarum* causes symptoms similar to those of *Alternaria citri*. Contamination by rotting, infested plant wastes occurs during harvesting;
- black mould rot of peel caused by *Aspergillus niger* affects wounded or damaged fruits stored at a temperature of over 15°C;
- infection in the orchard by *Botryosphaeria ribis*, *Physalospora rhodina* or *Diaporthe citri* causes a brown and then blackish rot of the skin and the underlying tissues in the stalk zone during storage. It is controlled by orchard or postharvest treatments.

Citrus post-harvest diseases	Blue mould <i>Penicillium italicum</i>	Green mould <i>Penicillium digitatum</i>	Black rot Anthracnose <i>Alternaria citri</i>	Brown patch <i>Glomerella cingulata</i> (= <i>C. gloeosporioides</i>)	Brown rot <i>Phytophthora</i> sp.
Symptoms and parts of the fruit affected	Paling and softening of the skin; white down (mycelium) then appears; covered with blue spores; pulp affected simultaneously.	Slight paling and softening of the epidermis; then bright white down grows in circular layers, covers with green spores from the centre. The entire fruit (peel, pulp) is finally affected, fruit cannot be eaten from the beginning.	Black rot on columella and segments, and/or peel.	Spotting of unripe fruits developing into brown patches that become soft with ripening and then affect the pulp. Marked odour. Degreened fruits very susceptible.	Start: spotted discoloration of peel and then spread of the patches; variable colour with brown patches and finally fruit disintegration. In storage: fine white mycelium with brown areas; characteristic odour.
Infection pathway	Spores on intact epidermis, fruit to fruit contamination.	Spores on wounded epidermis.	Wounds, penetration by the navel and the style scar.	Fruits wounded in the field.	Spores on intact epidermis.
Site of infection	From packing to consumption.	In the orchard, but above all from picking to consumption.	Orchard and warehouse.	Orchard.	Orchard: splashing with water. Packing: contaminated washing water. Storage: fruit to fruit contamination.
Species and varieties susceptible	All varieties.	All varieties	Navel orange, madarin, lemon.	All varieties, but above all mandarins.	All varieties (orange more susceptible).



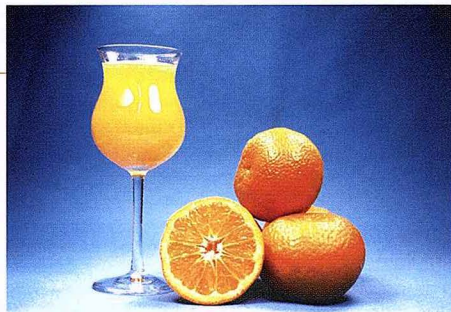
Citrus varieties

Variety photographs © Camille Jacquemond, SRA Inra-Cirad

Easy peelers

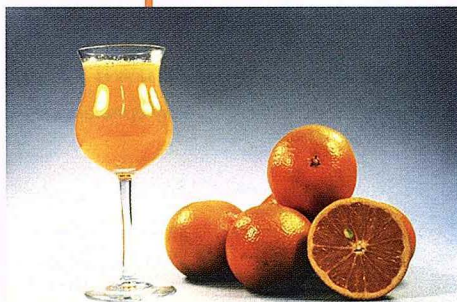
Clementine

This group of varieties is probably the result of hybridisation of *Citrus deliciosa* and an orange. Its success — considerable around the Mediterranean — is related to the interesting fruit characteristics (seedless in pure plantations, good colour and flavour) combined with a long sales period. Indeed, clementines are present on markets in the northern hemisphere from the end of September to the end of February thanks to the different cultivars (Marisol, Oroval, Oronules, Nules, Common or Fine, Hernandine, Nour, etc.).



Nova

Present on markets from mid-November to January, this medium-sized fruit is the result of a cross between common clementine and Tangelo. It has interesting qualities: marked skin colour, deep orange tender juicy pulp with no seeds and sweet flavour with low acidity. The fruits must nevertheless be picked rapidly to prevent the swelling of the peel. It is widely grown in Spain (Clemenvilla), Israel (Suntina) and Morocco.



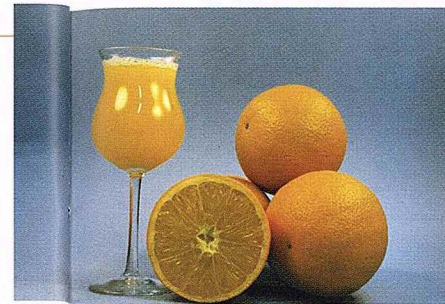
Minneola

A hybrid between tangerine and grapefruit, this large round fruit is characterised by a pronounced stem-end neck. The peel is a particularly strong reddish orange colour. The pulp, with few seeds, has a very special flavour. The variety is grown mainly in Israel and Turkey.

Oranges

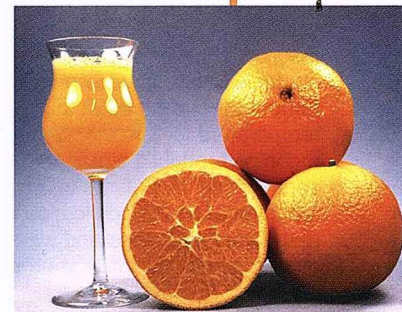
Valencia Late

Originating in the Azores, Valencia is the most commonly planted variety in the world. This medium-sized variety is round and slightly oblong. The peel is thin, well-coloured and slightly grainy. The flesh is very juicy, with 2 to 4 seeds. It is also known as Maroc Late (from Morocco) and Jaffa Late (from Israel).



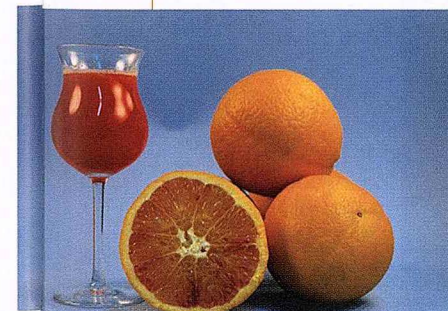
Navel

A round to oval dessert orange with a strongly developed navel. The peel is grainy, thin and fairly well coloured. The flesh is crisp, fine and not very juicy. Early cultivars (Naveline) and late cultivars (Navelate, Lane Late) in the Navel group are available on northern hemisphere markets from October to May.



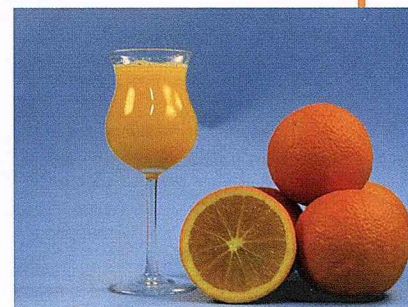
Maltese

This high-quality well-coloured orange is grown almost only in the Cape Bon region of Tunisia, where conditions bring out its full potential. It is medium-sized and slightly oval. The soft peel is slightly grainy and easy to remove. The tender, juicy flesh is little coloured for a blood orange. The flavour is particularly pleasant with sweetness balanced by a good level of acidity.



Salustiana

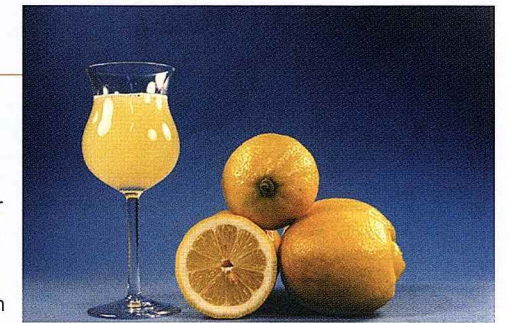
Very popular in Spain, this blond juice orange is medium-sized to large. The peel is of medium thickness with fine granulation. The flesh is delicate and sweet with a very pleasant taste. It is also seedless.



Lemons

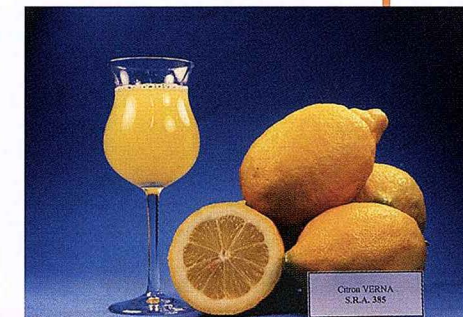
Eureka

This variety little planted in the Mediterranean forms the greater part of world production. It is widespread in the southern hemisphere. The fruit is of average size, elliptic to oblong in shape with a medium-sized apical nipple that is slender at the base. The peel is fine to medium thick. The pulp is generally seedless and rich in juice with high acidity.



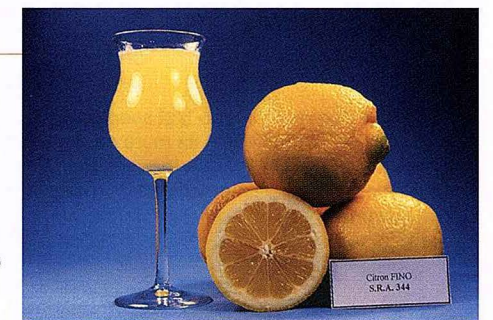
Verna

The fruit is medium to large with a pronounced, broad-based nipple. The rough epidermis is fairly thick. The juice has high acidity but extraction yield is only medium. One of the main Spanish varieties.



Fino

This cultivar dominates Spanish production and is much grown in the Murcia region. The fruit is a regular spherical or oval shape. The nipple is shorter than that of Verna. The peel is thin and smooth. The pulp contains 5 to 8 pips and is juicier than that of Verna.



Limes

The Tahiti lime (*Citrus latifolia*) is a triploid variety and is the most widespread of the sour limes. The peel is green/yellow to pale yellow and contains an essential oil with a very characteristic odour. The pulp is generally seedless, yellowish green and rich in very sour juice.

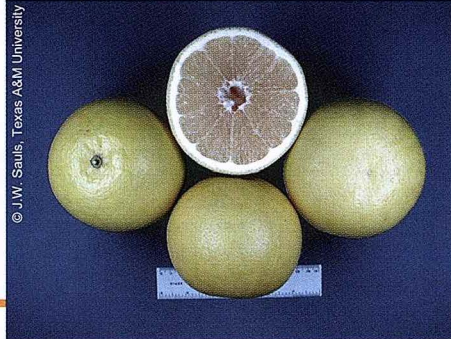
Another variety, Mexican lime (*Citrus aurantifolia*), is little exported as it contains a large number of seeds.



© Régis Domergue

Marsh

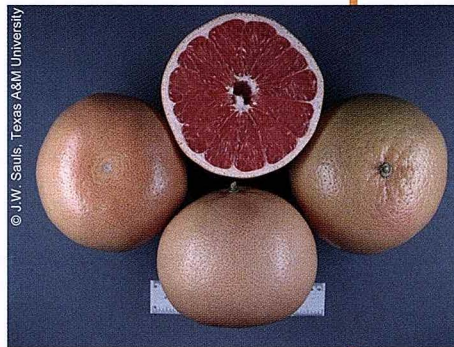
Marsh, with white pulp, is currently the most commonly planted and widely distributed cultivar in the world. In spite of a general trend towards coloured varieties, its strong point is that it is the first practically seedless variety (2 to 3 pips per fruit) and is excellent for storage. The fruit is medium-sized to small, with even, medium-thick and very smooth peel. The flesh is tender and very juicy with satisfactory taste characteristics, in spite of a few problems of high acidity at the start of the season and loss of aroma at the very end.



Grapefruits

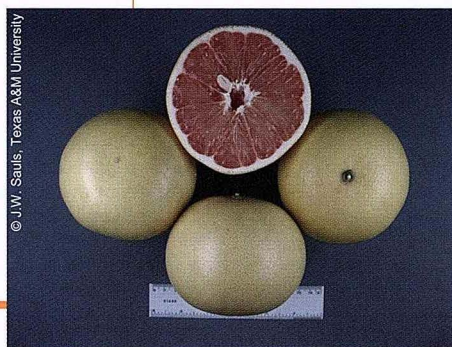
Star Ruby

The main virtue of this variety, disseminated in 1970, is the marked colour of the flesh. The peel is thin and smooth with strongly red faces. The fruits are also almost completely seedless. Finally, the flesh is firm and juicy, with high acidity and sugar content and giving strongly coloured juice. However, orchard management is very delicate and yields are small. The variety is therefore tending to decline to the benefit of other hardier cultivars (Rio Red, Flame).

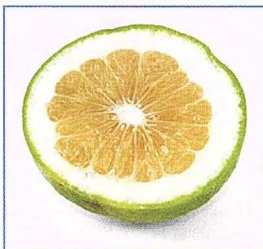


Ruby

Ruby is derived from the first seedless coloured variety (Thompson). It differs in its more pronounced peel and flesh colour and slightly lower sugar and acids contents. Ruby is the most widely planted coloured variety. It still forms a substantial proportion of new plantings in Florida. In contrast, it is losing impetus in Israel and South Africa.

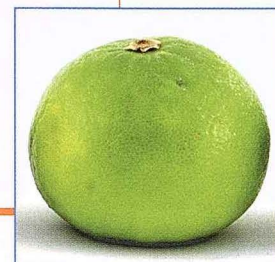


© Régis Domergue



Oroblanco (Sweetie)

A triploid cross between a pummelo and a seeded white grapefruit, Sweetie has similar fruits to those of Marsh, but flatter and distinctly larger. The peel is fairly thick and keeps its green colour for much longer. The flesh is pale and the central axis wide and hollow. The juice content is lower, the sugar content is higher and the acidity lower than in Marsh. In addition, Sweetie has no bitterness. The variety is widespread in Israel.



© Régis Domergue