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FRuiTROP

English edition

Close-up

CITRUS

Counter-season grapes: prospects are still good

Juice and pulp prices in Europe

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Citrus

A report prepared by
Eric Imbert

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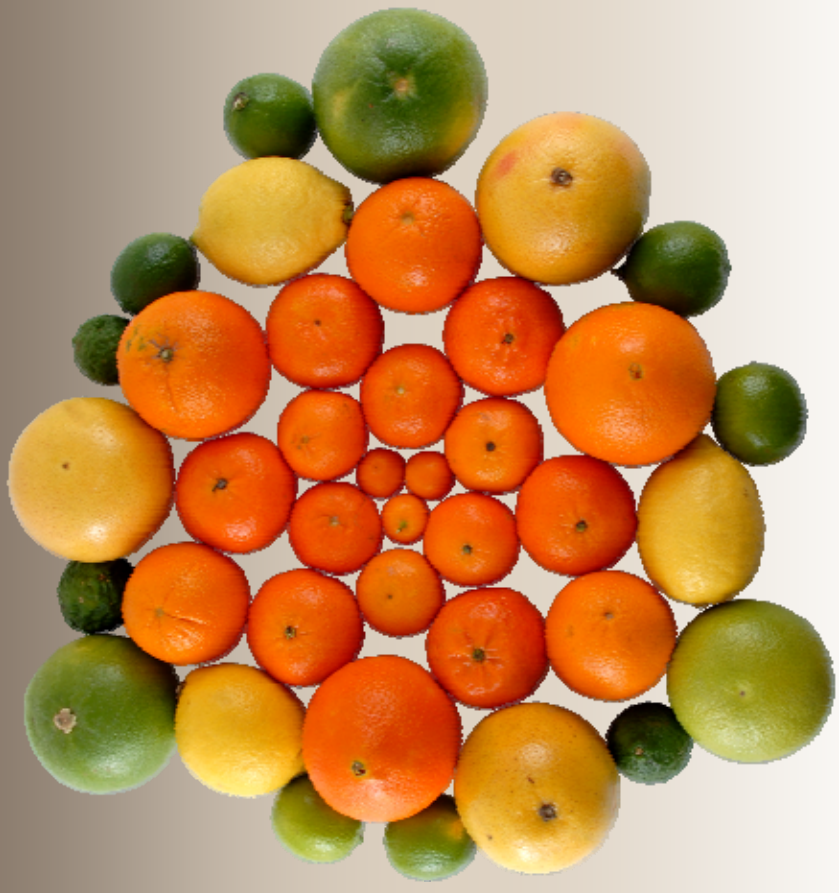
After easy peelers in November 2010 and grapefruit in June 2011, FruiTrop now reviews the international fresh orange market in its annual section devoted to winter citrus. What are the options for attempting to relaunch consumption on the mature markets in the rich countries? How can the trade benefit from the margins for growth still available in Eastern Europe or on the domestic markets in producer countries? These questions are addressed here. In addition to forecasts for the coming winter season, this section is also the occasion to take a close look at Morocco, a strongly growing citrus producing country where growers aim at doubling the harvest by 2020.



The world orange market

A queen whose beauty has faded

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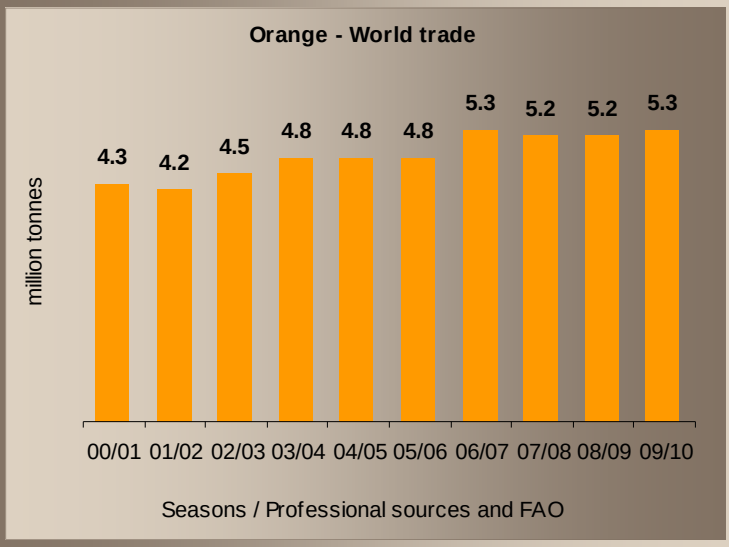
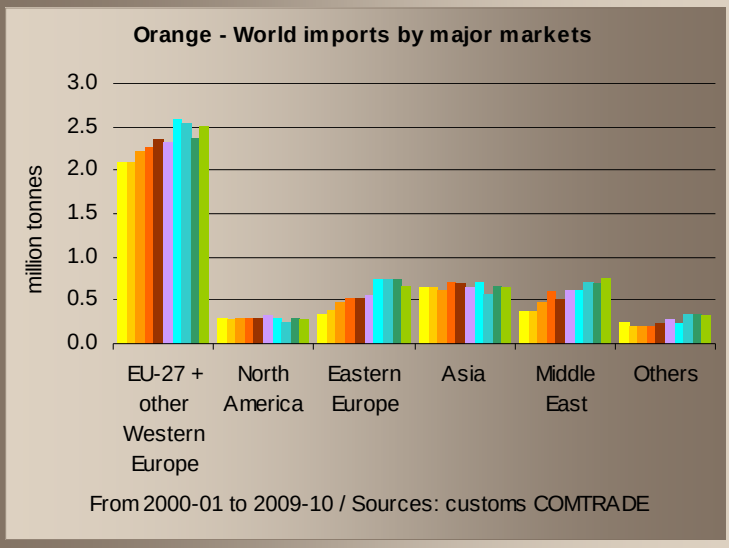
With an average of 5.2 to 5.3 million tonnes changing hands in recent years, orange is still a heavyweight in the world fruit trade and is one of the three leading fruits, lying third after banana (15 to 16 million tonnes) and apples (7 to 8 million tonnes). Today, nearly half of the citrus traded worldwide consists of 'Navel', 'Valencia' and others of the same ilk, in spite of the growth of trade in easy peelers. However, although the queen of citrus has not lost her crown, she is finding it increasingly difficult to resist the horde of competing produce. The fine growth dynamics of the early 2000s, with an increase of a million tonnes in 6 years, is over, replaced by complete calm since the mid 2000s.

One of the last driving forces of the world market has stalled

Analysis of world imports leads to a disturbing observation: growth has stopped practically everywhere, whatever the market in question. In the European Union, the leading consumption region in the world accounting for nearly 50% of world trade, the measured growth resulting from the increase in the supply of late dessert oranges from Spain ('Lanelate' and related varieties) and summer oranges from the southern hemisphere has ceased and volumes are stagnating. The situation is even worrying on the markets in the other rich countries which take much more moderate quantities. Imports are decreasing in Canada and especially in Japan, with the United States remaining a minor destination. But the most alarming news is the stagnation of con-





sumption in Eastern Europe, which accounts for about 15% of world trade. The countries in this zone have ceased to play their role as a driving force on the world market; imports had doubled in the first half of the 2000s and have since reached a ceiling at 700 000 t. The only area that still contributes to growth of the world market is the Middle East, a market similar in size to that of Eastern Europe.

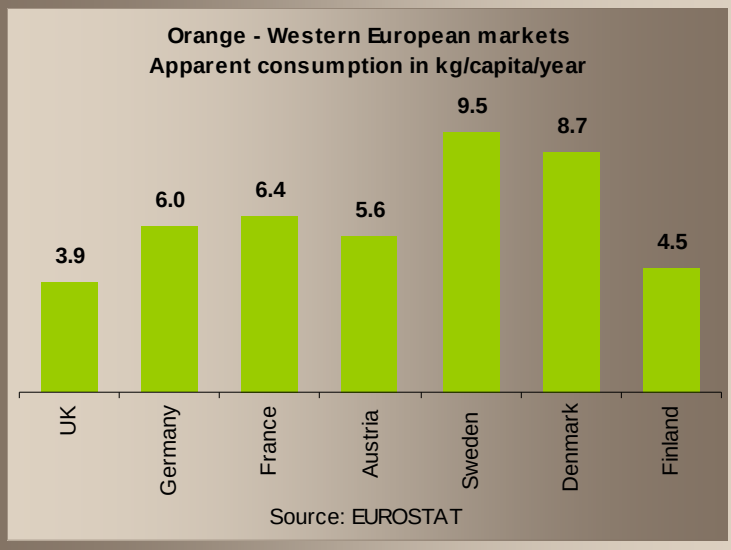
Difficult re-launching in the rich countries

How can the trend be reversed? This seems difficult in the most developed countries. High incomes allow what economists call the 'qualitative substitution' effect in demand to operate strongly. Consumers thus favour products that are easier to eat and that have comparable nutritional and organoleptic qualities. Fresh oranges—caught between prepared juice and easy peelers, is probably one of the fruits most affected by these changes. And it has to be observed that innovations increasing the competitiveness of these two groups of products have been much more numerous than for oranges in recent years. The price competitiveness of entry-level juices made from concentrate has remained strong with the price of a litre of juice being lower that that of fresh fruits purchased for home pressing. Likewise, the supply of high-quality products based on single juice that is flash-pasteurised or not has increased enormously. In parallel, varietal innovations in easy peelers have resulted in a lengthening of the season and improvement in quality.

Orange — World imports by major markets

000 tonnes	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
EU-27 + other western European countries	2 101	2 090	2 214	2 268	2 346	2 320	2 591	2 536	2 374	2 522
North America	299	288	300	291	307	312	302	265	297	279
Eastern Europe	339	390	487	528	523	564	738	748	748	679
Asia	649	646	630	715	696	657	716	569	674	653
Middle East	376	378	492	595	510	635	618	711	690	770
South America	184	161	167	148	157	185	129	242	235	246
Africa	36	35	33	42	50	56	70	73	73	45
Oceania	26	23	18	25	26	28	29	23	31	27
Total	**4 010**	**4 011**	**4 340**	**4 610**	**4 617**	**4 757**	**5 195**	**5 167**	**5 123**	**5 221**

Sources: national customs, COMTRADE



Limited prospects in Western Europe

There seems to be little room for growth in Western Europe as present consumption of 6.5 kg per person per year is already a record for non-producer countries. However, analysis of apparent consumption figures reveals a number of potential target markets in which consumption is still smaller than in other countries with comparable profiles. This is the case of Finland where purchases of oranges are half those of Sweden and Denmark. The same applies in the UK where consumption is 2 kg per person per year less than in Germany, France and Austria. These countries are probably those most likely to respond to promotion operations, even if the strong anchorage of convenience foods in the UK should be allowed for.

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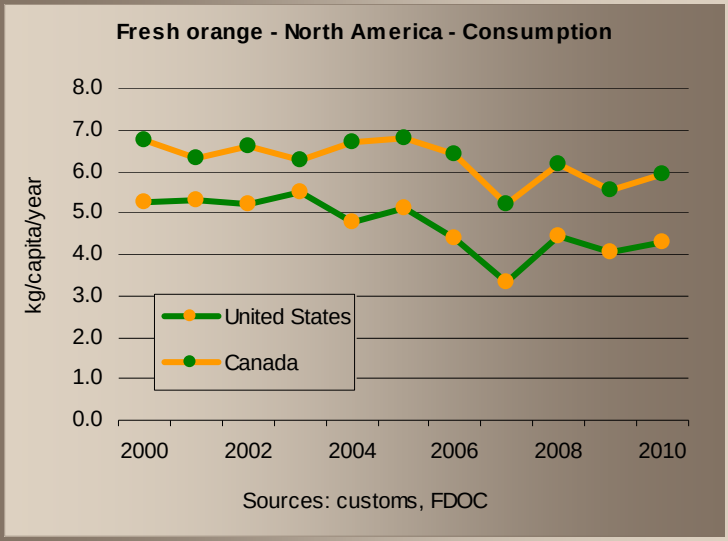

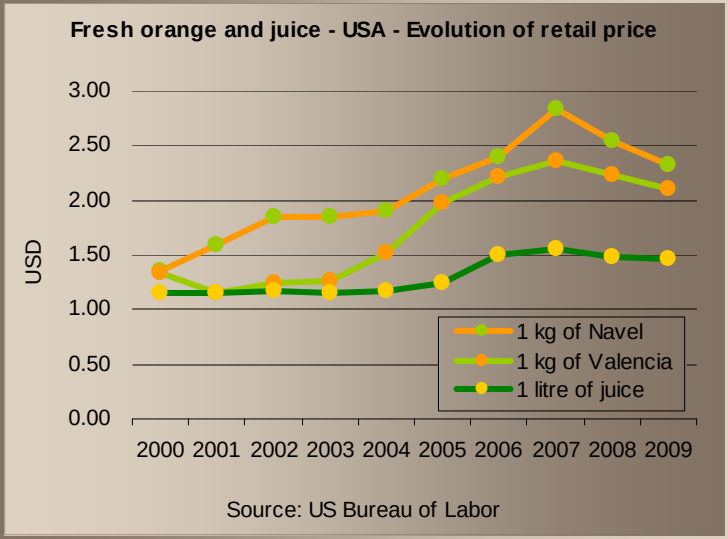

Fresh oranges pricey in the United States!

Is there more room for growth on the United States market? This might reasonably be doubted even though average consumption at some 4.2 kg per person per year is very small for a producer country and even smaller than the level observed in non-producer Western European countries. As in the United Kingdom, the change in consumption habits has benefited 'convenience' products considerably. Volume per person has decreased by one kilogram during the past decade, especially as fresh oranges have lost their price competitiveness. The price of 'Navel' has increased by more than 30% and that of 'Valencia' by more than 70% since the Florida hurricanes!

The other factor slowing the growth of imports is the presence in California of large domestic production and a powerful lobby. The combination of these two factors means that US imports of fresh oranges remain limited to 15 000 to 25 000 tonnes during the winter when Californian 'Navel' production is at its peak and it is difficult to imagine substantial growth except in case of adverse weather conditions, as was the case with the frost in 2006-07. The only growing market segment that probably has some prospects is that of summer oranges because Californian 'Navel' oranges are not available from April to September. Imports from the southern hemisphere are growing but still very modest at 70 000 to 80 000 t. They are 7 to 8 times greater in Western Europe with a quarter of the population.

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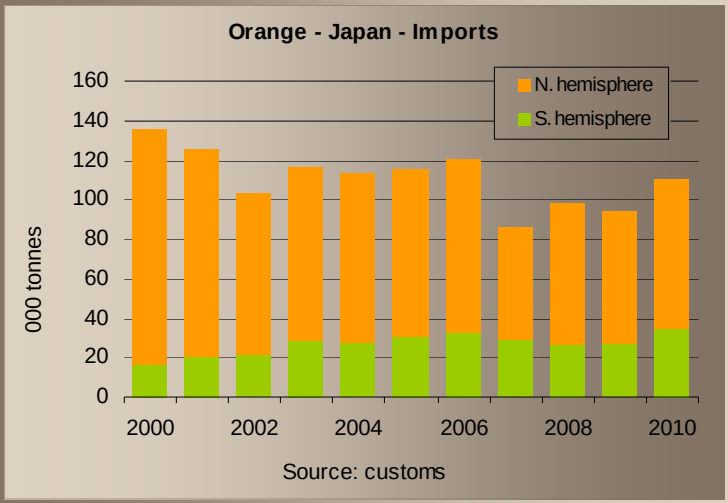
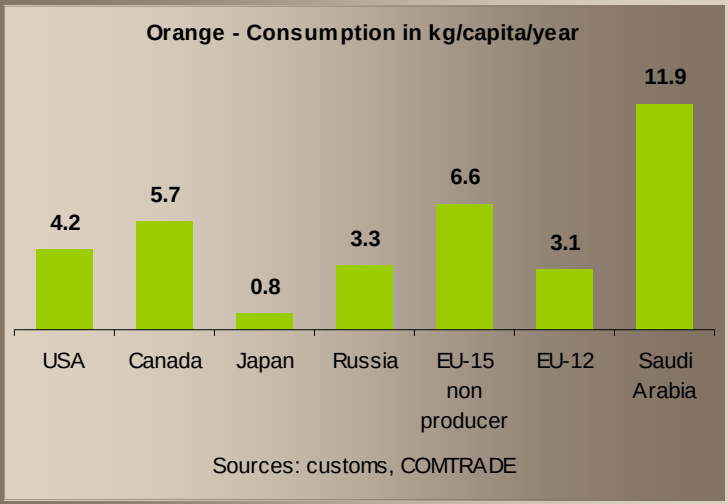
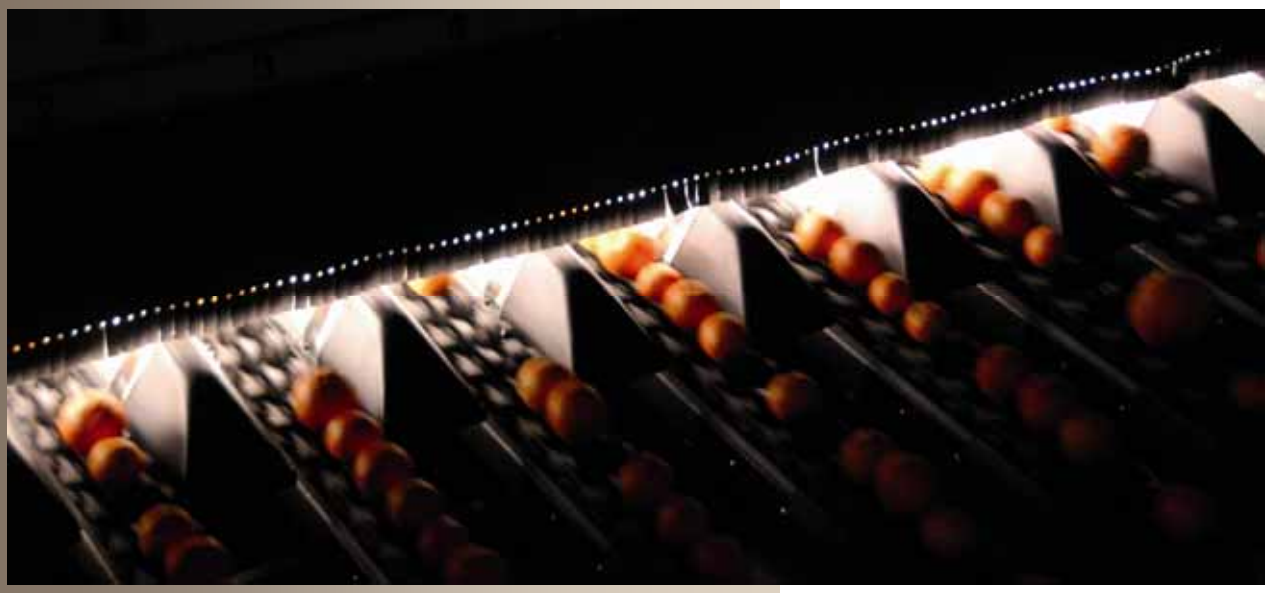




Young Japanese do not like peeling fruits

The prospects do not seem any better in Japan even though consumption is less than 1 kg per person per year. The boom of the late 1980s with the establishment of trade agreements with the United States for citrus fruits and beef has long gone. Although arrivals from the southern hemisphere are holding out at a modest 25 000 to 35 000 t per year, those from the northern hemisphere have halved since the mid-1990s and now total only 65 000 to 75 000 t. In contrast with the situation in the United States, the reason is not other citrus and citrus products. Domestic production of 'Navel' is practically nonexistent at some 3 000 t per year and although the 'Satsuma' crop still totals about 1 million tonnes, it is also tending to decrease. And there is no increase in competition from orange juice as imports are tending to dwindle. The reason is more the lack of interest of young people in oranges and more generally for produce that is not immediately ready to eat. So far, the ageing of the population mitigates the decrease but for how long? The only segment displaying growth is that of innovate varieties (Italian blood oranges, 'Cara Cara' with pink flesh, etc.), but the volumes involved are only those of a niche market.



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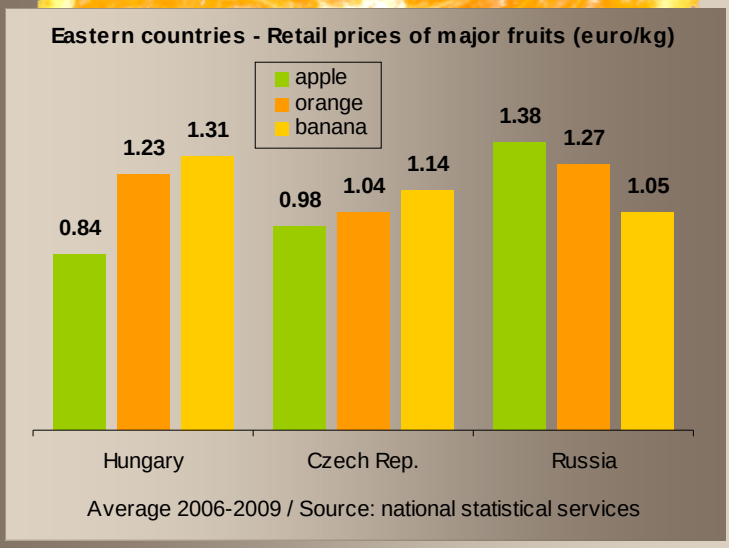
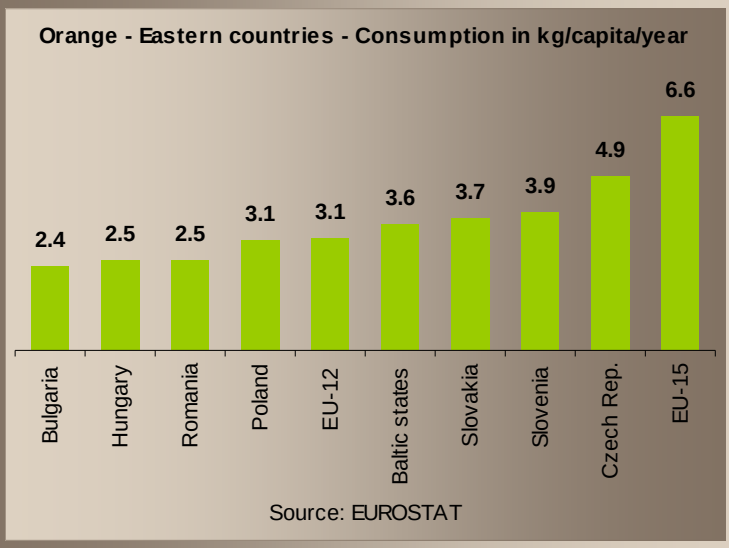




Californians frightened of greening

However, the situation could change dramatically both in the United States and Japan. California, the leading supplier of both markets, is under increasing threat from greening, a disease that is incurable today (**FruiTrop** 168). The most severe form of this bacterial affection that is deadly for orange trees is now a thousand kilometres from the frontier of California after its recent detection in southern Baja California in Mexico and the arrival of the disease seems unavoidable. However, the detection measures set up and the absence of hurricanes should make it possible to avoid a situation as rapidly devastating as that experienced in Florida where the arrival of greening and other sector difficulties (other sanitary problems such as citrus canker, low profitability, etc.) have reduced production by about 1000 field boxes in 5 years (i.e. more than 4 million tonnes). But it is clear that Californian production will not emerge unscathed from such a crisis, which might open the way to larger imports of fruits to compensate.

Under-consumption in Eastern Europe and considerable price elasticity of demand

The stagnation of consumption in the Eastern European countries is all the more worrying for sources exporting to these destinations as it is accompanied by a decrease in value. The increase in the power of suppliers in countries with very competitive producer costs, such as Egypt and, more recently, China, has resulted in a marked decrease in returns to producers in the traditional supplier countries. Is this halting of growth just an accident? The poor world economic situation has certainly played a role but it seems that the oranges are beginning to be replaced by easy peelers. As an example, imports of easy peelers in Russia and Ukraine have increased strongly again since 2010, but not those of oranges. Sales of clementines and small fruit hybrids now exceed those of 'Navel' oranges and similar in both of these countries.

All the same, it is in this part of the world that relaunching orange consumption

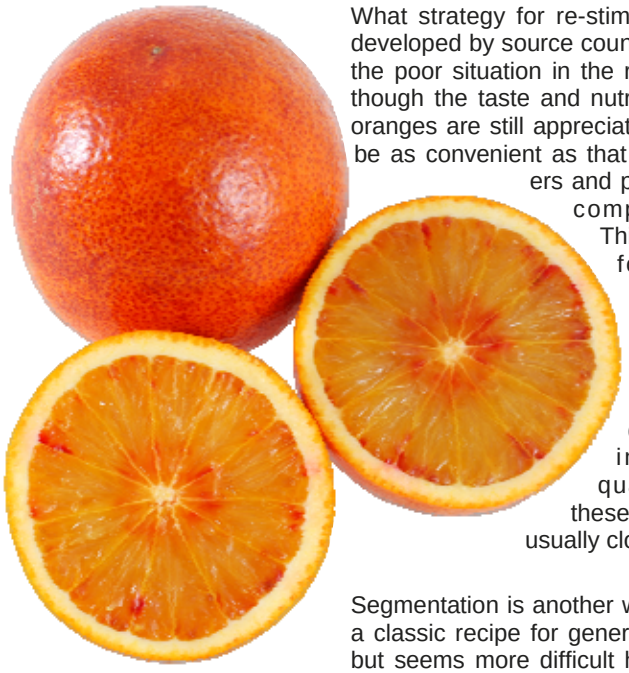
seems the least difficult. First, consumption is very small at 2.5 to 3.5 kg per person per year in most of the countries in the zone. Second, consumers in these countries with intermediate economies are very aware of retail prices, a factor where oranges still have a comparative advantage over easy peelers. A pitch putting forward both the organoleptic and nutritional qualities and the price advantage would probably seem to be a good driving force for sales.

Targeting allowing for local fruit production

Which Eastern European countries should be targeted for communication? It is important in targeting to take into consideration the existence of competing local fruit production sold at very competitive prices. As an example, in recent years apples have been sold at on average 45% less than oranges in Hungary; apples are mainly local and obviously competitive, without mentioning fruits grown and eaten by families. Thus Russia, Ukraine and the Czech Republic seem to be better targets than Poland, Hungary and Romania.

Re-launching the market with segment values seems difficult

What strategy for re-stimulation should be developed by source countries in the light of the poor situation in the rich countries? Although the taste and nutritional qualities of oranges are still appreciated, use will never be as convenient as that of the easy peelers and prepared juice that compete with them. This is a weak point for basing a relaunch that undoubtedly involves more an increase in the value of the produce than by an increase in the quantities sold on these markets that are usually close to maturity.



Photos © Régis Domergue

Segmentation is another weak point. This is a classic recipe for generating value-added but seems more difficult here than in other sectors. Apple trade professionals whose work in segmentation has been recognised have been able to use a broad range of very segmented features such as peel colour, texture and taste. The various sweet oranges currently available have similar taste profiles and texture and the main factor that can be played on is flesh colour. Perhaps a range of blood oranges should be relaunched alongside dessert and juice oranges. But how can they be anchored on retail shelves when production is limited to the winter months? Catania research centre in Sicily is working on lengthening the harvest calendar and already has a range of 'Tarocco' with internal and external colour and that can be harvested from the end of November to the end of March and even the end of May in the case of the less strongly coloured varieties*. Much work remains to be done but the recent discovery of the gene responsible for anthocyanin synthesis and its transposition factor should make it possible to accelerate the breeding work.

Making oranges easier to eat

Restoring value to the fruit by making it easier to eat is another possible pathway for the markets in rich countries. However, it is difficult to prepare cut ready-to-eat citrus fruits because of their texture and the presence of albedo. As a result, the simultaneous presence of a range of clementines and similar fruits that are easy to handle by nature and 100% natural limits the interest of this type of product.

In contrast, fresh juices would seem to be a more promising line. Small capacity juicers (throughput from one litre per minute) in which hygiene is no longer a challenge (the core of the machine can be cleaned in a dishwasher) are now available. A short search shows that they cost a minimum of EUR 2000 and so they are still reserved for

* For the detailed varietal range, see:
http://www.agrinnovazione.regione.sicilia.it/reti/Agrumicoltura/pubblicazioni/scelte_varietali_agrumicoltura.pdf

professional use. But supermarket chains, cafés and the catering industry—both institutional and commercial—offer interesting prospects. They are gradually becoming equipped and supermarket chains are starting to sell juices pressed on the spot at some EUR 2.50 per litre, a price close to that of manufactured products. How can the professionals upstream contribute to the distribution of these machines? Could institutions in consumer countries play a role using a public health approach, by supporting the installation of machines in school canteens for example?

A strategy to re-launch consumption by means of price in countries with intermediate economies

The choice of lever to be used to stimulate markets in countries with intermediate economies is clearer. Promoting 'the cheapest source of pleasure and vitamin C on the market' is probably the direction to take. This approach used for oranges, possibly more than for any other citrus fruit, is to optimise costs from the orange grove and on through the entire logistic chain to maximise the price difference in comparison with easy peelers. However, a strategy based solely on price competitiveness is not enough. Expectations with regard to quality, certification and breadth of the range are also increasing on these markets, especially with the growing power of supermarket chains. The investments to be made are therefore not neutral. Retail distributors must then play the game and not cream off the benefits of the efforts made upstream.

An exclusive strategy requiring accompaniment

Only the large groups would appear to be able to develop a strategy of this kind that is based essentially on economies of scale. Small producers would seem to be excluded from the start. In addition, although the source countries with the lowest labour costs obviously seem to be the best placed, those of the western Mediterranean have soil and climate advantages that make for a longer range than those of the counterparts in the east (frost risk for late varieties in Turkey and extreme temperatures at the beginning and end of the season in Egypt). Finally, how can growers be encouraged to invest in oranges when the profitability of easy peelers seems much more immediate today? Governments would probably have to provide encouragement by setting up more stimulating plantation aid systems for oranges than for easy peelers.

Use the guarantee of outlets on domestic markets to develop a competitive export range for Eastern European countries

The orange market is less attractive in terms of profitability and less dynamic than that of easy peelers and thus has more limited prospects for development. Although caution is a watchword in plantation programmes, some production sources possess advantages for the development of supply that combine quality, length of range and price competitiveness matching the expectations of countries with intermediate economies. Although success is not ensured, these producer countries have an alternative domestic market that provides security. It should be stressed that the domestic markets in the countries along the southern shores of the Mediterranean have grown faster than exports in the last decade and form substantial growth potential under the combined effects of population increase and an improved standard of living. Investing in reasonable areas devoted to orange production might prove in time to be less risky than placing all bets on easy peeler, as is now the case in a fair number of Mediterranean producer countries ■

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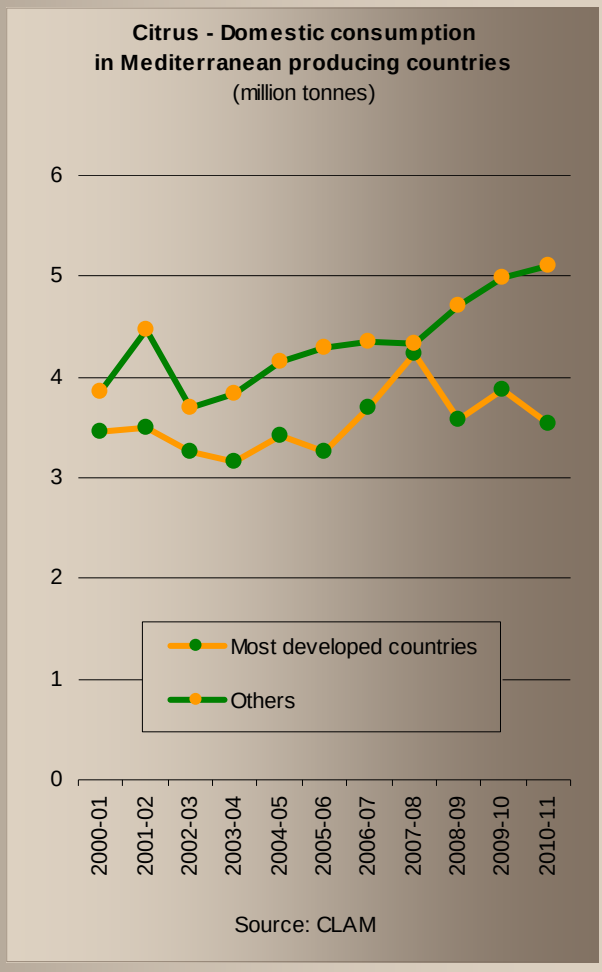
Domestic markets in Mediterranean producer countries: development potential that should not be neglected!

Although consumption in the richest Mediterranean producer countries has changed little in the past decade, that of their counterparts with less developed economies has increased strongly. Considering only the countries for which we have reliable statistical data (Morocco, Tunisia and Turkey), the increase during the period has been more than a million tonnes, that is to say an annual increase of about 5%. There are two driving forces behind this growth, that does not seem to be fading. Population dynamics, with an increase of about 13 million during the period, should continue to follow the same trend, with a further increase of 13 million by 2020 according to FAO forecasts. And then the rising standard of living that gives a growing proportion of the population access to fruit and vegetables should continue to be furthered by good economic growth. When the other Mediterranean countries in a similar situation are considered (Algeria, Libya, Egypt, Syria and Jordan), it is seen that a growing market of more than 260 million people is available for Mediterranean producers. And although the average returns are not those of the international market, there are no delays in payment or difficult events (sales on a commission basis, unpaid bills).



Citrus — Domestic consumption

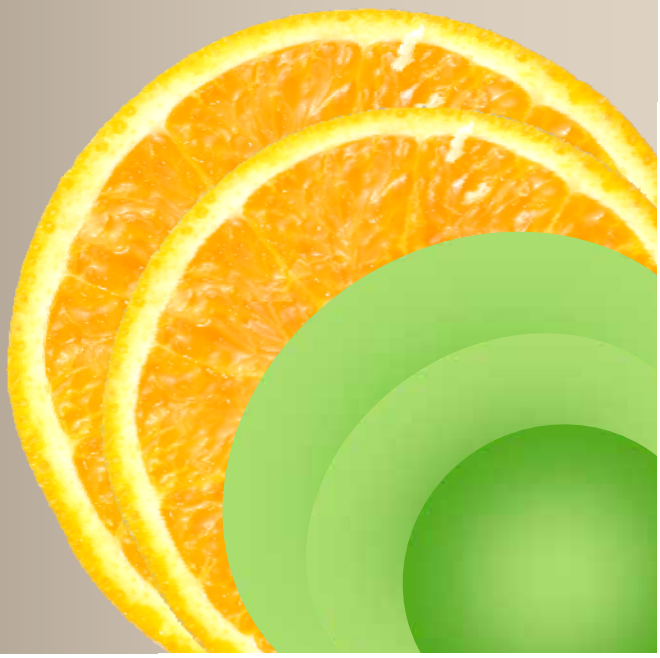
000 tonnes	Average 2009-11	Average 2000-02	Evolution
Turkey	1 546	944	+ 602
Morocco	1 044	636	+ 408
Tunisia	291	236	+ 55
Total	**2 881**	**1 817**	**+ 1 064**

Source: CLAM

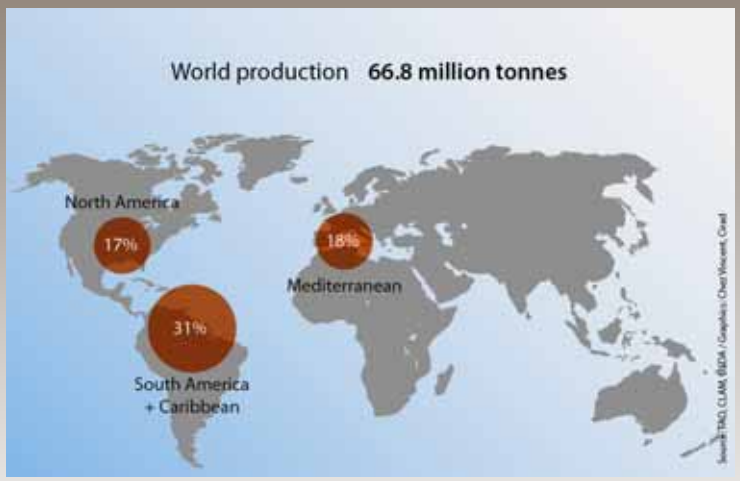
Evolution of mediterranean population

millions	Population in 2010	Forecast in 2020	Evolution
Egypt	81.1	94.8	+ 13.7
Turkey	72.8	80.8	+ 8.0
Algeria	35.5	40.2	+ 4.7
Morocco	32.0	35.1	+ 3.1
Tunisia	10.5	11.5	+ 1.0
Libya	6.4	7.1	+ 0.7
Jordan	6.2	7.4	+ 1.2
Syria	20.4	24.1	+ 3.7
Total	**264.7**	**300.9**	**+ 36.1**

Source: FAOSTAT



ORANGE — Production



Orange — The 10 leading producer countries	
tonnes	**2010**
Brazil*	16 200 000
United states *	7 760 000
China**	6 000 000
India **	5 000 000
Mexico*	3 850 000
Spain*	3 000 000
Iran**	2 700 000
Egypt*	2 350 000
Indonesia**	2 200 000
Italy*	2 150 000

*average 2009-10/2010-11, **average 2008-09 / Sources: FAO, USDA, professionals

ORANGE — Imports

Orange — The 10 leading importing countries	
tonnes	**2010**
Germany	567 000 t
Netherlands	528 000 t
Russia	499 000 t
France	457 000 t
Saudi Arabia	322 000 t
United Kingdom	280 000 t
China	274 000 t
Canada	201 000 t
United Arab Emirates	180 000 t
Spain	144 000 t

Sources: national customs

USA — Imports — Main supplier countries						
000 tonnes	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Total N. hem, incl.	**15.7**	**13.8**	**54.3**	**19.1**	**18.4**	**23.6**
Mexico	13.0	11.0	19.2	16.1	16.1	20.6
Dominican Rep.	1.2	1.4	1.9	1.6	1.5	1.8
Total S. hem, incl.	**55.6**	**57.9**	**62.1**	**58.1**	**71.6**	**83.2**
South Africa	28.2	35.4	28.7	33.6	27.2	33.6
Chile	0.0	0.0	2.4	0.0	20.3	33.4
Australia	27.4	22.3	29.0	21.5	23.5	15.4
Total	**71.3**	**71.7**	**116.3**	**77.1**	**89.9**	**106.8**

Source: US customs - code HS 080520

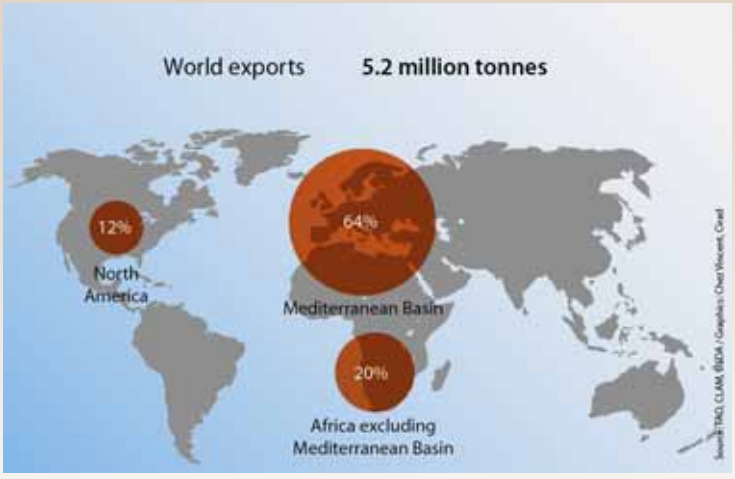
Canada — Imports — Main supplier countries						
000 tonnes	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Total N. hem, incl.	**156.1**	**169.2**	**127.0**	**160.2**	**148.7**	**162.4**
United States	150.6	162.2	94.9	155.5	141.2	159.8
Spain	1.3	2.4	9.5	1.2	3.3	1.5
China	1.7	0.6	7.4	0.6	1.7	0.6
Italy	0.6	0.6	1.7	1.1	0.3	0.3
Total S. hem, incl.	**62.4**	**38.8**	**40.5**	**43.2**	**36.5**	**37.4**
South Africa	46.3	26.5	26.9	31.9	27.1	26.8
Chile	4.5	3.4	4.5	6.8	2.3	3.8
Australia	6.5	4.1	3.6	3.1	3.8	3.7
Argentina	3.8	3.5	3.7	0.6	0.5	1.6
Others	0.8	1.2	4.2	0.9	0.8	1.0
Total	**218.6**	**208.2**	**167.7**	**203.7**	**185.9**	**200.5**

Source: COMTRADE - code HS 080520

Latin America — Imports						
000 tonnes	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Costa Rica	31.5	0.2	54.8	41.4	71.9	55.0
Suriname	48.0	53.9	48.8	50.3	48.0	50.0
Guatemala	5.2	0.6	54.6	47.5	34.8	47.9
Paraguay	29.4	15.5	14.3	20.6	28.8	37.0
Salvador	35.1	29.9	33.4	23.1	19.0	22.8
Mexico	28.4	23.4	18.6	24.9	10.9	22.5
Ecuador	0.6	0.7	5.1	17.4	13.7	9.0
Brazil	2.2	1.3	1.9	1.0	1.8	6.0
Chile	0.1	0.2	0.2	0.5	0.2	2.7
Total	**181.4**	**125.9**	**235.5**	**231.6**	**236.0**	**257.7**

Source: COMTRADE - code HS 080520

ORANGE — Exports



Orange — The 10 leading exporting countries	
tonnes	**2010**
Spain*	1 396 000
South Africa**	957 000
Egypt*	810 000
United States	590 000
Greece*	356 000
Turkey*	260 000
Morocco*	169 000
China	162 000
Argentina**	151 000
Italy	129 000

*average 2009-10/2010-11, **average 2009-10 / Sources: professionals and national customs

EU-27 — Imports — Main supplier countries						
000 tonnes	2005	2006	2007	2008	2009	2010
Total N. hem., incl.*	**1 680.2**	**1 696.8**	**1 755.7**	**1 727.7**	**1 740.3**	**1 765.8**
Spain	1 124.2	1 114.5	1 231.2	1 113.1	1 233.9	1 097.5
Greece	104.9	158.0	110.5	138.2	120.8	221.2
Egypt	103.5	95.1	108.9	110.4	131.5	133.7
Italy	90.4	99.5	95.1	125.1	57.6	127.2
Morocco	132.4	140.6	97.2	138.9	90.4	93.0
Tunisia	18.2	18.8	16.5	25.8	19.9	22.3
Others	32.4	17.6	15.4	15.8	11.7	18.3
Israel	27.6	18.9	21.7	20.0	22.8	17.8
Turkey	30.6	13.9	39.9	20.8	32.9	17.4
Portugal	6.1	12.4	12.2	11.9	13.7	10.3
Total S. hem., incl.	**561.7**	**530.3**	**734.6**	**701.0**	**529.6**	**655.3**
South Africa	341.0	297.0	448.7	454.0	333.2	416.0
Argentina	75.6	81.9	114.6	96.3	81.4	86.7
Uruguay	75.1	64.9	72.3	57.7	59.3	71.3
Brazil	20.5	47.9	34.1	26.1	16.2	33.9
Zimbabwe	30.2	13.3	25.5	16.6	13.5	23.7
Swaziland	10.4	13.7	19.3	14.9	13.0	9.6
Chile	4.4	10.1	9.0	21.4	8.6	6.9
Total	**2 241.9**	**2 227.1**	**2 490.3**	**2 428.8**	**2 269.9**	**2 421.2**

* Extra Community imports and expeditions from the main EU producing countries (Spain, Italy, Greece) / Source: EUROSTAT - code HS 080520

Other Western European countries — Imports						
000 tonnes	2005	2006	2007	2008	2009	2010
Switzerland	60.2	61.9	63.8	62.3	61.7	64.4
Norway	31.2	37.2	41.0	39.6	37.5	37.7
Iceland	1.7	2.0	2.2	1.9	1.6	1.6
Total	**93.1**	**101.1**	**107.0**	**103.8**	**100.8**	**103.8**

Source: COMTRADE - code HS 080520

Russia — Imports — Main supplier countries						
000 tonnes	2005	2006	2007	2008	2009	2010
Total N. hem., incl.	**270.0**	**348.6**	**329.0**	**356.4**	**320.1**	**327. 5**
Egypt	88.7	109.0	110.0	135.1	128.5	149.9
Turkey	82.2	101.3	65.3	54.6	85.4	76.9
Morocco	88.4	125.7	138.7	140.2	81.0	63.8
China	4.0	5.4	7.2	9.3	13.1	15.2
Spain	3.0	4.8	7.4	10.1	6.0	15.1
Israel	2.0	0.4	0.2	4.8	3.2	2.1
United States	0.1	0.1	0.0	1.3	1.3	1.6
Syria	0.0	0.0	0.0	0.5	1.0	1.1
Cyprus	0.0	0.3	0.0	0.1	0.0	0.9
Greece	1.6	1.8	0.1	0.3	0.5	0.8
Total S. hem., incl.	**684.0**	**898.1**	**908. 8**	**890. 5**	**800.0**	**167.6**
South Africa	54.7	81.7	101.2	103.9	94.0	131.7
Argentina	46.7	64.5	49.2	30.3	19.7	28.7
Uruguay	16.6	11.8	6.3	5.2	5.6	6.4
Others	563.7	738.2	748.5	747.8	679.1	3.7
Total	**391.1**	**509.8**	**491.0**	**502.0**	**443.6**	**498.8**

Source: COMTRADE - code HS 080520

Ukraine — Imports — Main supplier countries						
000 tonnes	2005	2006	2007	2008	2009	2010
Total N. hem., incl.	**85.2**	**114.2**	**126.6**	**119.9**	**108.3**	**107.2**
Egypt	40.5	60.5	80.8	87.2	67.4	68.5
Turkey	34.0	31.3	27.5	19.2	33.6	29.7
Spain	3.6	5.4	6.7	5.5	4.1	6.1
Greece	3.7	4.1	1.0	0.8	1.0	1.2
Cyprus	1.0	10.7	7.7	5.0	1.5	0.8
Italy	0.0	0.3	0.4	0.6	0.3	0.8
Morocco	0.0	0.6	1.5	0.4	0.2	0.2
Total S. hem., incl.	**17.1**	**28.4**	**29.4**	**20.4**	**17.3**	**17.2**
South Africa	12.3	18.6	18.0	14.8	14.4	15.9
Argentina	4.8	9.2	11.3	4.4	2.6	0.9
Others	0.3	0.1	0.0	0.2	0.2	0.4
Zimbabwe	0.0	0.0	0.2	1.0	0.3	0.4
Total	**102. 6**	**142.7**	**156.0**	**140.5**	**125.8**	**124.8**

Source: COMTRADE - code HS 080520

Other Central and Eastern European countries — Imports						
000 tonnes	2005	2006	2007	2008	2009	2010
Serbia	25.1	28.7	35.3	38.2	40.3	39.3
Belarus	16.5	21.2	24.2	23.0	21.5	24.7
Albania	15.8	18.6	21.2	20.8	20.6	22.1
Macedonia	5.8	6.0	6.9	7.0	8.3	9.0
Armenia	1.5	3.6	2.8	4.1	4.2	6.8
Moldavia	2.7	3.5	4.0	4.5	5.0	5.1
Georgia	2.6	4.2	4.3	4.3	6.0	5.1
Total	**70.0**	**85.7**	**101.5**	**105.3**	**109.8**	**116.0**

Source: COMTRADE - code HS 080520

Japan — Imports — Main supplier countries						
000 tonnes	2005	2006	2007	2008	2009	2010
Total N. hem., incl.	**84.6**	**88.2**	**56.3**	**71.6**	**66.8**	**75.5**
United States	84.6	88.2	56.3	71.6	66.8	75.5
Italy	84.6	88.2	46.5	71.5	66.8	75.4
Israel	0.0	0.0	0.7	0.1	0.0	0.1
Total S. hem., incl.	**30.8**	**32.7**	**29.5**	**26.2**	**27.6**	**34.4**
Australia	8.4	15.5	15.5	13.1	18.3	25.3
South Africa	11.0	7.7	10.3	8.4	7.4	7.1
Chile	11.4	9.4	3.7	4.7	1.9	2.0
Total	**115.4**	**120.9**	**85.8**	**97.8**	**94.4**	**109.9**

Source: Japanese customs - code HS 080520

Other Asian countries — Imports						
000 tonnes	2005	2006	2007	2008	2009	2010
China	218.7	241.7	182.5	235.6	246.0	274.0
South Korea	123.0	124.5	77.7	107.9	71.2	110.1
Malaysia	86.6	94.1	87.0	88.4	86.5	83.1
Singapore	41.0	40.9	39.2	41.4	40.5	41.7
Philippines	17.3	30.7	21.9	29.7	39.8	35.9
Indonesia	29.7	26.2	23.6	28.0	19.6	31.3
Kazakhstan	6.7	9.5	18.5	19.1	16.1	18.0
Azerbaijan	1.2	2.5	2.3	1.8	5.2	11.8
Vietnam	8.1	8.5	11.3	10.4	10.5	10.5
India	1.6	2.4	3.2	5.0	9.9	10.0
Thailand	1.8	3.3	2.5	5.6	8.5	7.3
Sri Lanka	3.8	5.0	3.3	3.6	4.3	4.5
Total						

Source: COMTRADE - code HS 080520

Oceania — Imports						
000 tonnes	2005	2006	2007	2008	2009	2010
Australia	12.6	12.8	9.9	15.8	15.2	19.5
New Zealand	15.3	15.7	13.3	15.6	12.3	13.2
Total	**28.0**	**28.5**	**23.2**	**31.4**	**27.4**	**0.0**

Source: COMTRADE - code HS 080520

Persian Gulf — Imports						
000 tonnes	2005	2006	2007	2008	2009	2010
Saudi Arabia	319.0	323.8	310.1	278.2	303.6	322.5
United Arab Emirates	88.7	110.9	127.8	164.1	178.5	180.0
Iran	40.6	32.8	41.0	102.0	152.0	136.4
Kuwait	48.0	53.0	79.2	94.3	100.0	100.0
Oman	34.6	35.5	34.8	38.2	37.9	40.2
Qatar	15.2	15.7	18.8	21.6	20.0	23.4
Bahrain	16.6	12.7	11.6	12.0	19.1	14.3
Yemen	2.0	2.3	3.6	3.6	4.3	4.5
Total	**564.6**	**586.9**	**626.9**	**714.1**	**815.5**	**821.3**

Source: COMTRADE - code HS 080520

Near East — Imports						
000 tonnes	2005	2006	2007	2008	2009	2010
Jordan	13.3	13.9	16.3	16.9	16.4	28.7
Turkey	54.1	40.3	64.9	29.8	40.9	28.6
Syria	2.6	4.2	4.3	4.3	19.0	20.0
Total	**70.0**	**58.4**	**85.5**	**51.0**	**76.3**	**77.2**

Source: COMTRADE - code HS 080520

Africa — Imports						
000 tonnes	2005	2006	2007	2008	2009	2010
Sudan	13.3	13.9	16.3	16.9	16.4	23.0
Gambia	2.6	4.2	4.3	4.3	0.0	17.0
Côte d'Ivoire	0.4	14.3	5.7	6.8	1.7	13.2
Algeria	10.8	8.3	9.1	8.3	5.9	12.1
Zambia	10.8	8.3	9.1	8.3	5.9	7.1
Kenya	1.5	2.0	1.8	1.1	1.9	5.3
Namibia	1.5	2.5	2.6	2.8	2.5	2.5
Senegal	2.3	2.8	3.1	2.5	1.5	2.0
Botswana	0.0	0.0	0.0	0.0	0.0	1.8
South Africa	0.3	0.6	4.1	3.0	9.2	1.3
Ghana	7.6	10.5	16.5	18.7	0.0	0.0
Total	**66.9**	**85.5**	**93.3**	**94.0**	**80.4**	**133.9**

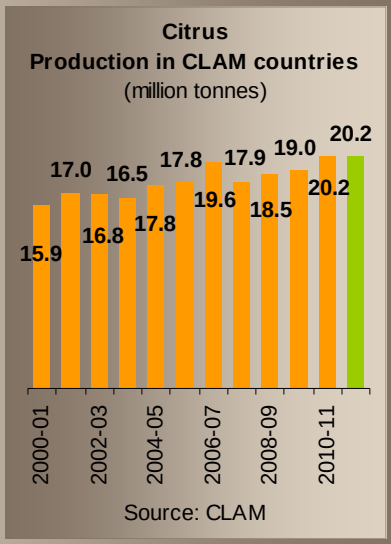
Source: COMTRADE - code HS 080520

2011-12 harvest forecasts Mediterranean citrus

Not as small a harvest as it would seem

Mediterranean production

- **Production totalling some 22.5 million tonnes including 20 million from CLAM countries.**
- **18% of world production estimated at 121 million tonnes.**
- **2nd production zone in the world after China (23 million tonnes).**



Citrus — Provisional production in CLAM countries

000 tonnes	2011-12	2010-11	Variation 2011-12 on 2010-11	Average for the 4 last years	Variation 2011-12 on the average
Spain	**5 675**	6 627	- 14%	6 011	- 6%
Egypt	**3 461**	3 461	0%	3 396	+ 2%
Italy	**3 569**	3 204	+ 11%	3 296	+ 8%
Turkey	**3 385**	3 078	+ 10%	2 718	+ 25%
Morocco	**1 867**	1 700	+ 10%	1 434	+ 30%
Greece	**1 081**	1 094	- 1%	1 025	+ 5%
Israel	**567**	460	+ 23%	519	+ 9%
Tunisia	**306**	302	+ 1%	275	+ 11%
Cyprus	**261**	254	+ 3%	197	+ 33%
France	**20**	20	0%	24	- 20%
Total	**20 191**	**20 198**	**0%**	**18 895**	**+ 7%**

The harvest forecast published at the end of October at the General Meeting of the Liaison Committee for Mediterranean Citrus Fruit Culture (CLAM) shows the dynamism of Mediterranean citrus growing once again. It is true that production should be very slightly smaller than that of the record 2010-11 season but for the second time in its history the total will exceed 20 million tonnes. The Mediterranean citrus crop has increased by nearly 4 million tonnes in less than a decade.

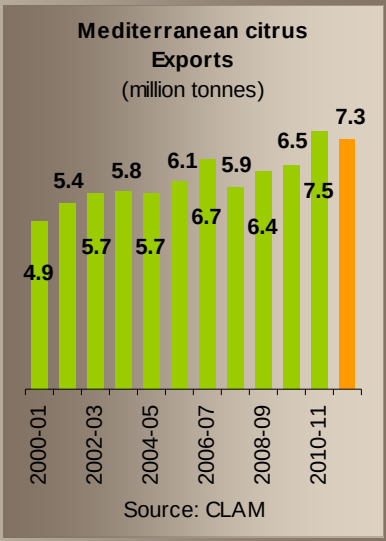
The countries with the most competitive costs are showing a very significant increase in production this season again, showing how their area under citrus is increasing. Turkey, with 3.4 million tonnes expected, should continue to break production records. The harvest has increased by nearly 1.5 million tonnes in 10 years, in particular thanks to the new groves in Cukurova plain. Likewise, growth is continuing in Egypt even if the figures to confirm it are lacking. At a more modest level, the increase is about 500 hectares per year in Tunisia, where production will thus exceed 350 000 t for the first time.

The start of growth dynamics in Morocco is confirmed. Production should approach 1.9 million tonnes in 2011-12, giving an increase of more than 600 000 t in three years after harvests

Mediterranean exports

(orange, easy peelers, grapefruit and lemon)

- **Increasing exports of more than 7 million tonnes.**
- **65% of world trade estimated to total 11.5 million tonnes.**
- **The world's leading export zone.**



Citrus — Provisional exports by CLAM countries

000 tonnes	2011-12	2010-11	Variation 2011-12 on 2010-11	Average for the 4 last years	Variation 2011-12 on the average
Spain	**3 205**	3 644	- 12%	3 277	- 2%
Egypt	**859**	924	- 7%	853	+ 1%
Italy	**363**	256	+ 42%	220	+ 65%
Turkey	**1 488**	1 389	+ 7%	966	+ 54%
Morocco	**571**	529	+ 8%	534	+ 7%
Grece	**464**	462	0%	285	+ 63%
Israel	**189**	155	+ 22%	170	+ 11%
Tunisia	**25**	23	+ 8%	25	0%
Cyprus	**126**	126	0%	81	+ 56%
France	**20**	18	+ 9%	22	- 11%
Total	**7 309**	**7 526**	**- 3%**	**6 433**	**+ 14%**

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that have stagnated at 1.2 to 1.3 million tonnes since the beginning of the 2000s. The wave of planting and replanting performed in recent years within the framework of the Maroc Vert plan should accelerate the phenomenon in the future (see article in this issue). In contrast, the recovery of Cypriot production confirmed in 2011-12 is not the result of an increase in the planted area but more releated to less water supply constraints thanks to increased rainfall in recent seasons and investment in desalination plants.

The trend is more for stagnation or even a decrease in the orchard areas of the countries with the highest production costs. However, Spanish and Israeli producers are still reconverting production structures to optimise added value. The Spanish harvest, that seems to have stabilised at between 5.5 and 6.5 million tonnes, should be towards the bottom of this range in 2011-12. The aim is to limit production during the plethoric period from November to January (500 000 to 600 000 t per month to be exported during this period!) and to develop the late supply of easy peelers, as has already been done for oranges. The very strong increase in Israeli production just indicates a return to normal volumes after climatic and sanitary phenomena resulted in a historically weak 2010-11 season. The grubbing up of orange and white grapefruit is continuing, compensated by the plantation of late easy peelers. Cultivated areas seem to be shrinking faster in Italy and Greece where the lack of competitiveness of the sector remains a major problem. However, the trend is not seen in the crops levels announced for 2011-12 as alternate bearing is positive this season and weather conditions are better.

Although information on harvest volumes indicates a better balance for Western European markets, consumption trends are somewhat negative. The economic downturn seems to have a surprising and sensitive effect on purchases of fruits. In addition, the bad reputation of fresh fruit and vegetables following the Escherichia coli crisis still seems to have marked effects on the northern European markets.

Oranges:
close to a historical record

At a little more than 11 million tonnes, the Mediterranean orange crop forecast is very high and close to the record set last season. In five years the Mediterranean has confirmed its position as the second production region in the world after Brazil by increasing production by a million tonnes.

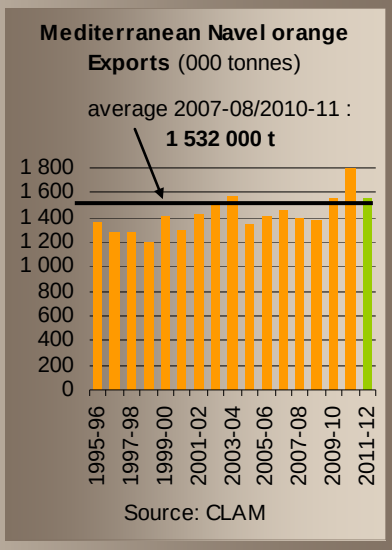
The pressure on the Eastern European markets promises to be particularly strong. Two of the leading suppliers of these destinations have historically large harvests, with Turkey exceeding 1.4 million tonnes for the first time and Morocco approaching a million tonnes

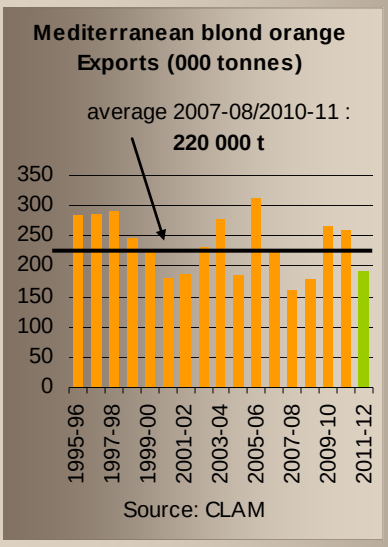
The increase in Egyptian production should also continue, even if figures to prove it are lacking. Export volumes should increase significantly even though domestic markets are growing rapidly. Allowance should also be made for increased exports from China, a source that might well not be as discreet as in 2010-11 as the harvest is back to normal. This may well cause problems for the sources with the highest production costs. And with an average harvest similar to that of 2010-11, Greece may well suffer at the hands of Turkey on the Balkan markets.

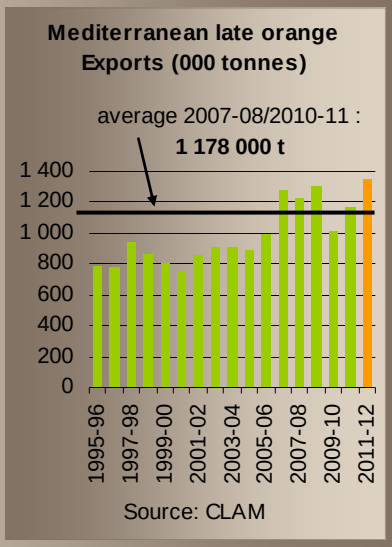
Conversely, the Western European markets may be less amply supplied, at least at the beginning of the season. The Spanish harvest of early varieties displays a marked deficit. In addition, the transition from southern hemisphere supply was smooth and competition from easy peelers should be weaker than in previous years (deficit of 'Nules'). The market may be less open in the second part of the season with a deficit tending to ease or even disappear as a result of extensive planting of late 'Navel' in Spain in recent years. In addition, Morocco also displays a desire to regain its share on the EU markets, especially with 'Maroc Late' with a view to the expected increases in volume resulting from the Maroc Vert plan. The market window for southern hemisphere 'Navel' might be as small as it was in 2011. Much of the increase in production forecast in Italy and Tunisia will be sold on their domestic markets.

Mediterranean oranges

- **Exports of approximately 3.3 million tonnes.**
- **63% of world trade estimated to total 5.2 million tonnes.**
- **The world's leading export zone.**







Orange — Provisional exports from CLAM countries

000 tonnes	2011-12	2010-11	Variation 2011-12 on 2010-11	Average for the 4 last years	Variation 2011-12 on the average
Spain	**1 342**	1 501	- 11%	1 372	- 2%
Morocco	**215**	175	+ 23%	204	+ 6%
Israel	**30**	12	+ 142%	23	+ 30%
Tunisia	**23**	23	+ 2%	23	- 1%
Turkey	**351**	319	+ 10%	230	+ 53%
Italy	**195**	118	+ 66%	107	+ 82%
Cyprus	**36**	31	+ 16%	22	+ 62%
Greece	**385**	383	+ 1%	287	+ 34%
Egypt	**753**	811	- 7%	807	- 7%
Total	**3 330**	**3 372**	**- 1%**	**3 075**	**+ 8%**

Orange — Provisional exports by variety

000 tonnes	2011-12	2010-11	Variation 2011-12 on 2010-11	Average for the 4 last years	Variation 2011-12 on the average
Navel/Naveline	**1 564**	1 795	- 13%	1 532	+ 2%
Blond	**192**	262	- 27%	218	- 12%
Blood	**234**	157	+ 49%	154	+ 52%
Late	**1 342**	1 163	+ 15%	1 178	+ 14%
Total	**3 330**	**3 372**	**- 1%**	**3 075**	**+ 8%**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Easy peelers:
less pressure, especially in the heart of the season

At 5.4 million tonnes, the harvest of the most emblematic group of citrus fruits from the Mediterranean is distinctly smaller than last season's but is one of the largest of recent years. This varietal group has displayed the strongest growth in recent years, with an increase in production of 1.5 million tonnes since 2003-04.

The return of production in Spain, the great leader, to a slightly smaller than average crop after a bumper 2010-11 season should relieve pressure on international markets, especially during the peak of the season and at the end. The period of growth of Spanish plantations has finished and the decrease in the production of 'Nules' illustrates the reconversion efforts made by Spanish growers to reduce volumes in November and December when the market is too liberally supplied. The expected decrease in the harvest of late fruits ('Hernandina' clementine and hybrids) seems more marked and more conjunctural. 'Nadorcott' will be the only Spanish variety sold at this time of the year and the

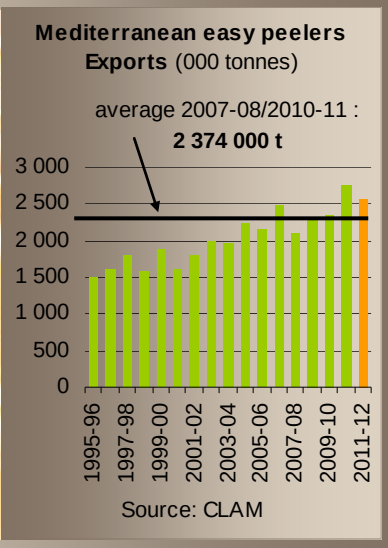
crop will increase as numerous groves have been planted in recent years. Plantation of recently bred late triploid hybrids should begin soon. In spite of a record harvest resulting from a strong increase in the area under citrus, Morocco's export potential is very similar to last year's, in particular because of the growing domestic market. The very slight increase in 'Fine' clementine will be counter-balanced by a conjunctural decrease in 'Nour' (just over 70 000 t expected for export in comparison with 79 000 t in 2010-11) and a more structural decrease in the quantities of 'Nova' and 'Ortanique', which are now present in only limited quantities. As in Spain, 'Nadorcott' should also escape the general decrease in the volumes of late varieties, with production of just over 40 000 t. Israel will be back with large volumes in 2011-12, contrasting 2010-11 when quantities were strongly limited by weather and sanitary problems. The harvest is reaching a record level thanks to new plantations in recent years (about 700 ha in 2009 and more than 1 000 ha in 2010 and 2011). With about 55 000 t, 'Or' is displaying the greatest increase, now forming about a third of total production. The merely average production of these three countries that cover most of the supply of Western Europe leads to thinking that prices should be higher than last year on these markets. Cypriot and Corsican production, with an average level in 2011-12, with complete the supply of this part of the world.

Although the production area is increasing strongly, Turkish production should decrease markedly for reasons of alternate bearing and so the Eastern European markets should be clearer. This is good news for Moroccan exporters who are among the leading suppliers of this region. But growth of exports from Asian sources should continue or resume. Together with these, Chinese mandarines and 'Kinnow' from Pakistan accounted for 20% of the Russian market in 2010.

The United States market should remain fairly open to Mediterranean produce. Californian domestic competition should be on the same scale as last year, with the harvest of 'Satsuma', clementines and late hybrids increasing by only 20 000 t to reach 360 000 t. However, even if the margin for increase in consumption is very large, the growth of the area under citrus—which doubled in seven years and approached 16 000 ha in 2010 should be considered in the medium term.

Mediterranean easy peelers

- **Increasing exports totalling 2.6 to 2.8 million tonnes.**
- **71% of world trade estimated to total 3.8 million tonnes.**
- **The world's leading export zone.**



Easy peelers — Provisional exports from CLAM countries

000 tonnes	2011-12	2010-11	Variation 2011-12 on 2010-11	Average for the 4 last years	Variation 2011-12 on the average
Spain	**1 400**	1 625	- 14%	1 459	- 4%
Morocco	**349**	349	0%	309	+ 13%
Corsica	**20**	18	+ 9%	19	+ 4%
Israel	**70**	56	+ 24%	57	+ 22%
Turkey	**464**	451	+ 3%	345	+ 34%
Italy	**96**	102	- 6%	81	+ 18%
Cyprus	**55**	59	- 7%	43	+ 28%
Greece	**76**	76	0%	40	+ 90%
Egypt	**45**	31	+ 43%	20	+ 125%
Total	**2 575**	**2 768**	**- 7%**	**2 374**	**+ 8%**

Easy peelers — Provisional exports by variety

000 tonnes	2011-12	2010-11	Variation 2011-12 on 2010-11	Average for the 4 last years	Variation 2011-12 on the average
Satsuma	**322**	323	0%	235	+ 37%
Clementine	**1 470**	1 637	- 10%	1 472	0%
Mandarin	**211**	256	- 18%	210	0%
Ortanique	**13**	14	- 9%	14	- 10%
Nova	**153**	156	- 2%	157	- 2%
Others	**406**	382	+ 6%	286	+ 42%
Total	**2 575**	**2 768**	**- 7%**	**2 374**	**+ 8%**

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Grapefruit:
large potential in Turkey

Historically large production of 750 000 t is announced for the 2011-12 season in the Mediterranean. This record, illustrating the strong growth dynamics of this varietal group whose harvest increased by 250 000 tonnes in seven years, can be ascribed solely to Turkey. Average production was about 200 000 t until 2008-09, when it rocketed. The forecast is 365 000 t in 2011-12. However, this would seem to be a ceiling as the wave of plantations in the first part of the 2000s seems to have finished. The trend is very different in the other Mediterranean producer countries. Israel, the second largest in terms of volume, has announced a return to a normal production level after the very small 2010-11 harvest. But 'White Marsh' plantations are still decreasing, with export potential maintained thanks to the stability of areas under 'Star Ruby'. The end of the grubbing up of 'Sweetie' should also be noted after the fairly satisfactory financial returns in 2010-11. The Cypriot harvest

should hold at a satisfactory level for the third year running after a long period of decline. However, the trend is only the result of more generous rainfall and the areas under white grapefruit are still decreasing, as in Israel. Spain will be the only country where the harvest is clearly smaller than last season and the average in spite of a slightly larger area under 'Star Ruby'.

The effects of the increase in Turkish production should be felt very strongly in Eastern Europe (countries outside the EU and Romania), to which most of Turkish exports are shipped. The pressure on small fruits should be very strong as these are largely dominant in this season's Turkish harvest. The situation seems less menacing in Western Europe since as a rule Turkey usually only ships significant volumes to Germany. The cumulated potential of Israel, Spain and Cyprus, forming the greater part of supply of Mediterranean fruits, appears to be somewhat smaller than average. In addition, Israeli exporters should continue their efforts to increase the proportion of fruits for diversification markets that are more lucrative than the EU.

Arrivals from Florida should not change much even though the export potential seems greater than last season's. Production is similar but the change from very limited fruit size in 2010-11 to large fruits in 2011-12 is a positive feature. However, the fall of the euro against the dollar might have a negative effect. In addition, the sanitary barrier to access to the EU market for reasons of the presence of citrus canker in Florida is more difficult to get through each year.

Nevertheless, even if the information from upstream seem fairly encouraging, maintaining consumption levels seems to be more difficult every year, requiring Mediterranean professionals to respect minimum organoleptic features (**FruiTrop**, special issue on grapefruit, June 2011).

Mediterranean grapefruit

- **Increasing exports totalling 330 000 to 340 000 t.**
- **44% of world trade estimated to total 760 000 tonnes.**
- **The world's leading export zone.**


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Grapefruit — Provisional exports from CLAM countries

000 tonnes	2011-12	2010-11	Variation 2011-12 on 2010-11	Average for the 4 last years	Variation 2011-12 on the average
Spain	**47**	52	- 10%	44	+ 7%
Israel	**82**	84	- 2%	84	- 2%
Cyprus	**27**	26	+ 5%	21	+ 30%
Turkey	**160**	145	+ 10%	139	+ 15%
Italy	**2**	7	- 71%	5	- 62%
Egypt	**18**	17	+ 5%	12	+ 48%
Total	**337**	**331**	**+ 2%**	**305**	**+ 10%**

Florida grapefruit

- **The world's leading producer.**
- **Volumes stable for 3 years.**
- **Exports decreasing, especially to the EU because of access restrictions for reasons of citrus canker.**

Grapefruit from Florida — Evolution of domestic shipments and exports

million boxes of 42.5 lb	2006-07	2007-08	2008-09	2009-10	2010-11	Variation 2010-11 on average of the 4 last years	Variation 2010-11 on 2009-10
USA	6.8	6.2	6.0	6.1	5.4	- 14%	- 11%
EU	4.4	5.0	3.9	3.5	3.1	- 26%	- 10%
Japan	7.9	7.0	6.0	6.3	5.4	- 21%	- 14%
Canada	1.3	1.2	1.1	1.2	1.1	- 6%	- 5%
Others	0.3	0.5	0.3	0.4	0.5	+ 25%	+ 7%
Total	**20.6**	**19.8**	**17.4**	**17.4**	**15.4**	**- 18%**	**- 11%**

Grapefruit from Florida — Evolution of production

millions field boxes of 85 lb (approx. 38.6 kg)	2011-12	2010-11	Variation 2011-12 on 2010-11	Average of the 4 last years	Variation 2011-12 on the average
Florida	**20.1**	19.8	+ 2%	22.1	- 9%

Lemons:
as if boosted by vitamins

Just like grapefruit, the Mediterranean lemon harvest should reach a historical level in 2011-12, exceeding a million tonnes for the first time. Among the large players in the region, Spain will have a smaller crop than last year but still slightly larger than average. The deficit of 'Primofiore' masks a larger 'Verna' harvest resulting from satisfactory weather conditions and the reconversion in recent years of certain 'Primofiore' plantations to the benefit of more lucrative 'Verna'. The proportion sold fresh may well be larger than last season as the prices of concentrated juice and derivatives has decreased strongly after the massive batches processed in Argentina in summer 2011. The Western European markets may remain fairly sluggish, especially as demand seems quite slow at the beginning of the season in spite of a good transition after the southern hemisphere season. In addition, the Turkish harvest will be very large, accounting to a considerable extent for the expected increase in the Mediterranean harvest. The Turkish crop has doubled in less than ten years and will exceed the one million-tonne mark for the first time in 2011-12. The impact may well be felt strongly on the Eastern European markets and to a certain degree in Western Europe as Turkish lemons have tended to make progress in Austria and Germany in recent years.

Production is more limited in the other lemon-producing countries in the Mediterranean basin that export little. Italy, with a harvest forecast slightly down, will continue to sell most of its fruits on the domestic market and for processing. The 300 000 to 350 000 t of Egyptian sweet lemon should be sold practically only on the domestic market. Lemon production is developing but involves only limited quantities with small exports (10 000 to 20 000 t per year) sold mainly in the Middle East.

Will a small market window appear in the United States? The expected shortfall in Californian production makes it possible to ask this question. The California harvest covers practically all the fresh lemon market requirements in the US but is reported to be 15% down because of frost ■

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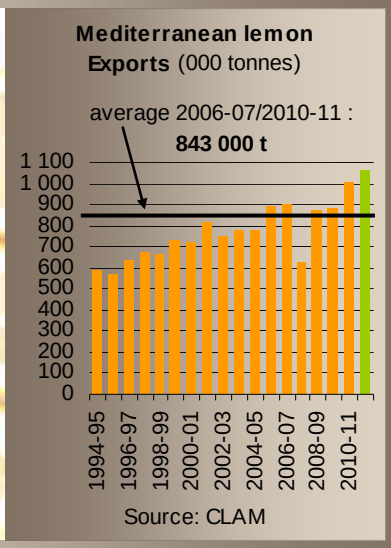
Mediterranean lemons

- **Increasing exports of between 1.0 and 1.1 million tonnes.**
- **65% of world trade estimated to total 1.6 million tonnes (with the exception of limes from Brazil and Mexico).**
- **The world's leading export zone.**



Lemon — Provisional exports from CLAM countries

000 tonnes	2011-12	2010-11	Variation 2011-12 on 2010-11	Average for the 4 last years	Variation 2011-12 on the average
Spain	**415**	461	- 10%	402	+ 3%
Cyprus	**8**	8	+ 4%	6	+ 45%
Turkey	**512**	466	+ 10%	360	+ 42%
Greece	**2**	2	0%	1	+ 51%
Italy	**70**	30	+ 136%	40	+ 77%
Egypt	**43**	29	+ 47%	27	+ 60%
Morocco	7	5	+ 37%	8	- 12%
Total	**1 057**	**1 001**	**+ 6%**	**843**	**+ 25%**

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Citrus — Mediterranean Basin production in 2010-2011

	000 tonnes	Total	France	Spain	Morocco	Algeria	Tunisia	Italy	Israel	Cyprus	Greece	Turkey	Egypt	Gaza*
Easy peelers	**Production**	**5 702.6**	**19.6**	**2 290.4**	**716.0**	**111.0**	**51.8**	**758.0**	**131.9**	**85.4**	**120.0**	**687.5**	**731.0**	**-**
	Domestic sales	2 081.0	-	305.0	361.9	111.0	-	377.1	47.5	10.3	35.0	212.6	620.6	-
	Industry	344.1	-	220.0	5.0	-	-	49.0	23.1	16.2	1.0	24.0	5.8	-
	Losses	338.0	1.7	140.0	-	-	-	110.2	5.0	-	8.0	-	73.1	-
	Export	2 767.7	17.9	1 625.4	349.1	-	-	101.7	56.3	58.9	76.0	450.9	31.4	-
Orange	**Production**	**11 592.3**	**-**	**3 344.7**	**904.0**	**415.0**	**202.4**	**1 950.0**	**87.0**	**97.8**	**922.0**	**1 260.0**	**2 350.0**	**59.4**
	Domestic sales	5 481.0	-	905.0	693.9	415.0	-	952.0	50.0	27.3	314.0	865.5	1 250.2	8.1
	Industry	1 633.1	-	690.0	35.0	-	-	605.5	24.6	39.9	130.0	75.0	18.8	14.3
	Losses	667.3	-	248.0	-	-	-	89.3	-	-	95.0	-	235.0	-
	Export	3 445.4	-	1 501.7	175.1	-	22.7	117.4	12.4	30.6	383.0	319.5	846.0	37.0
Lemon	**Production**	**2 891.8**	**-**	**927.3**	**80.0**	**44.0**	**47.5**	**488.0**	**55.7**	**18.9**	**46.0**	**860.0**	**320.0**	**4.4**
	Domestic sales	1 202.4	-	135.0	36.0	44.0	-	264.0	46.0	5.0	40.0	374.4	256.2	1.8
	Industry	442.5	-	299.0	-	-	-	110.0	4.0	6.0	-	20.0	2.6	0.9
	Losses	95.0	-	32.0	-	-	-	22.0	5.0	-	4.0	-	32.0	-
	Export	1 003.4	-	461.3	5.1	-	0.2	29.7	0.7	7.9	2.0	465.6	29.2	1.7
Grapefruit	**Production**	**650.0**	**-**	**64.6**	**-**	**-**	**-**	**7.5**	**185.8**	**51.8**	**5.8**	**270.0**	**60.0**	**4.5**
	Domestic sales	160.2	-	1.0	-	-	-	3.5	15.0	3.0	3.1	97.4	36.4	0.9
	Industry	140.9	-	8.0	-	-	-	-	88.2	20.1	0.5	20.0	0.5	3.6
	Losses	7.0	-	-	-	-	-	-	-	-	1.0	-	6.0	-
	Export	345.3	-	55.6	-	-	-	7.4	82.6	28.6	1.3	152.6	17.2	-
Others	**Production**	**84.7**	**-**	**-**	**-**	**-**	**50.3**	**28.2**	**5.8**	**-**	**-**	**-**	**0.4**	**-**
	Domestic sales	1.5	-	-	-	-	-	-	1.5	-	-	-	-	-
	Industry	28.2	-	-	-	-	-	28.2	-	-	-	-	-	-
	Losses	1.5	-	-	-	-	-	-	1.5	-	-	-	-	-
	Export	3.4	-	-	-	-	0.2	-	2.8	-	-	-	0.4	-
Total	**Production**	**20 921.4**	**19.6**	**6 627.0**	**1 700.0**	**570.0**	**352.0**	**3 231.7**	**466.2**	**253.9**	**1 093.8**	**3 077.5**	**3 461.4**	**68.3**
	Domestic sales	8 926.1	-	1 346.0	1 091.7	570.0	-	1 596.6	160.0	45.6	392.1	1 549.9	2 163.4	10.8
	Industry	2 588.8	-	1 217.0	40.0	-	-	792.7	139.9	82.3	131.5	139.0	27.7	18.8
	Losses	1 108.8	1.7	420.0	-	-	-	221.5	11.5	-	108.0	-	346.1	-
	Export	7 565.2	17.9	3 644.0	529.4	-	23.1	256.2	154.8	126.0	462.3	1 388.6	924.2	38.7

* estimate / Source: CLAM

Citrus — Provisional Mediterranean Basin production in 2011-2012

	000 tonnes	Total	France	Spain	Morocco	Algeria	Tunisia	Italy	Israel	Cyprus	Greece	Turkey	Egypt	Gaza*
Easy peelers	**Production**	**5 478.2**	**19.6**	**2 072.5**	**763.9**	**111.0**	**47.8**	**781.0**	**169.4**	**77.6**	**120.0**	**584.4**	**731.0**	**-**
	Domestic sales	2 252.3	-	352.0	409.9	111.0	-	539.0	70.0	9.8	35.0	104.9	620.6	-
	Industry	366.8	-	273.0	5.0	-	-	25.0	28.9	13.1	1.0	15.0	5.8	-
	Losses	285.5	1.7	47.5	-	-	47.8	121.0	-	-	8.0	-	59.5	-
	Export	2 573.1	17.9	1 400.0	349.0	-	-	96.0	70.0	54.8	76.0	464.4	45.0	-
Orange	**Production**	**11 484.7**	**-**	**2 684.2**	**948.5**	**415.0**	**209.0**	**2 260.0**	**131.0**	**113.9**	**910.0**	**1 403.7**	**2 350.0**	**59.4**
	Domestic sales	5 824.6	-	654.0	698.5	415.0	-	1 450.0	40.0	31.8	305.0	972.2	1 250.0	8.1
	Industry	1 522.6	-	642.0	35.0	-	-	495.0	61.0	46.5	130.0	80.0	18.8	14.3
	Losses	769.2	-	45.2	-	-	185.8	120.0	-	-	90.0	-	328.2	-
	Export	3 368.3	-	1 343.0	215.0	-	23.2	195.0	30.0	35.6	385.0	351.5	753.0	37.0
Lemon	**Production**	**2 973.4**	**-**	**722.9**	**154.4**	**44.0**	**49.0**	**520.0**	**62.0**	**19.7**	**45.0**	**1 032.0**	**320.0**	**4.4**
	Domestic sales	1 463.0	-	105.0	147.4	44.0	-	330.0	55.5	5.2	38.0	479.8	256.2	1.8
	Industry	352.8	-	200.0	-	-	-	100.0	3.0	6.3	-	40.0	2.6	0.9
	Losses	93.6	-	2.9	-	-	47.5	20.0	-	-	5.0	-	18.2	-
	Export	1 064.1	-	415.0	7.0	-	1.5	70.0	3.5	8.2	2.0	512.2	43.0	1.7
Grapefruit	**Production**	**745.5**	**-**	**48.0**	**-**	**-**	**-**	**8.0**	**205.0**	**49.5**	**6.0**	**364.5**	**60.0**	**4.5**
	Domestic sales	240.7	-	-	-	-	-	6.0	11.0	2.9	3.3	180.3	36.4	0.9
	Industry	160.8	-	1.0	-	-	-	-	112.0	19.2	0.5	24.0	0.5	3.6
	Losses	6.2	-	-	-	-	-	-	-	-	1.0	-	5.2	-
	Export	337.8	-	47.0	-	-	-	2.0	82.0	27.4	1.2	160.2	18.0	-
Others	**Production**	**94.8**	**-**	**-**	**-**	**-**	**53.3**	**30.0**	**11.1**	**-**	**-**	**-**	**0.4**	**-**
	Domestic sales	2.5	-	-	-	-	-	-	2.5	-	-	-	-	-
	Industry	35.6	-	-	-	-	-	30.0	5.6	-	-	-	-	-
	Losses	53.0	-	-	-	-	53.0	-	-	-	-	-	-	-
	Export	3.7	-	-	-	-	0.3	-	3.0	-	-	-	0.4	-
Total	**Production**	**20 776.6**	**19.6**	**5 527.6**	**1 866.8**	**570.0**	**359.1**	**3 599.0**	**578.5**	**260.8**	**1 081.0**	**3 384.5**	**3 461.4**	**68.3**
	Domestic sales	9 783.0	-	1 111.0	1 255.8	570.0	-	2 325.0	179.0	49.7	381.3	1 737.3	2 163.2	10.8
	Industry	2 438.5	-	1 116.0	40.0	-	-	650.0	210.5	85.1	131.5	159.0	27.7	18.8
	Losses	1 207.5	1.7	95.6	-	-	334.1	261.0	-	-	104.0	-	411.1	-
	Export	7 347.0	17.9	3 205.0	571.0	-	25.0	363.0	188.5	126.0	464.2	1 488.3	859.4	38.7

* estimate / Source: CLAM

Citrus — Mediterranean Basin — Provisional exports in 2011-2012													
000 tonnes	**Total**	**France**	**Spain**	**Morocco**	**Algeria**	**Tunisia**	**Italy**	**Israel**	**Cyprus**	**Greece**	**Turkey**	**Egypt**	**Gaza***
Total easy peelers	**2 573.1**	**17.9**	**1 400.0**	**349.0**	**-**	**-**	**96.0**	**70.0**	**54.8**	**76.0**	**464.4**	**45.0**	**-**
Satsuma	321.7	-	70.0	-	-	-	1.0	0.5	-	-	250.2	-	-
Clementine	1 468.7	17.9	1 010.0	295.0	-	-	90.0	-	-	52.0	3.8	-	-
Mandarin/Wilking	261.3	-	60.0	-	-	-	5.0	50.5	-	-	100.8	45.0	-
Ortanique	12.5	-	-	6.7	-	-	-	5.0	0.8	-	-	-	-
Nova	153.2	-	90.0	7.0	-	-	-	14.0	2.0	-	40.2	-	-
Various	355.6	-	170.0	40.3	-	-	-	-	51.9	24.0	69.4	-	-
Total oranges	**3 368.3**	**-**	**1 343.0**	**215.0**	**-**	**23.2**	**195.0**	**30.0**	**35.6**	**385.0**	**351.5**	**753.0**	**37.0**
Navel/Navelina	1 238.9	-	600.0	32.0	-	0.2	20.0	-	-	-	275.2	311.5	-
Salustiana	138.2	-	110.0	28.2	-	-	-	-	-	-	-	-	-
Shamouti	30.3	-	-	-	-	-	-	20.0	-	-	4.3	-	6.0
Common blond	19.9	-	-	-	-	-	-	-	-	-	19.9	-	-
Moro-Tarocco	160.0	-	-	-	-	-	160.0	-	-	-	-	-	-
Maltese	22.5	-	-	-	-	22.5	-	-	-	-	-	-	-
Sanguinelli	5.0	-	-	-	-	-	5.0	-	-	-	-	-	-
Other blood oranges	44.0	-	-	26.3	-	-	-	-	-	-	17.7	-	-
Verna	2.0	-	2.0	-	-	-	-	-	-	-	-	-	-
Ovale	0.2	-	-	-	-	-	-	-	-	-	0.2	-	-
Late	1 321.2	-	630.0	128.5	-	0.5	10.0	10.0	35.6	-	34.1	441.5	31.0
Bitter	1.0	-	1.0	-	-	-	-	-	-	-	-	-	-
Total grapefruits	**337.8**	**-**	**47.0**	**-**	**-**	**-**	**2.0**	**82.0**	**27.4**	**1.2**	**160.2**	**18.0**	**-**
White grapefruits	107.2	-	47.0	-	-	-	1.0	18.0	12.9	1.2	9.1	18.0	-
Other grapefruits	230.6	-	-	-	-	-	1.0	64.0	14.5	-	151.1	-	-
Total lemons	**1 064.1**	**-**	**415.0**	**7.0**	**-**	**1.5**	**70.0**	**3.5**	**8.2**	**2.0**	**512.2**	**43.0**	**1.7**
Other citrus	3.7	-	-	-	-	0.3	-	3.0	-	-	-	0.4	-
Total général	7 347.0	17.9	3 205.0	571.0	-	25.0	363.0	188.5	126.0	464.2	1 488.3	859.4	38.7

* estimate / Source: CLAM

Maroc Vert

A very ambitious plan that is now becoming a reality!

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Double Moroccan citrus production in a little more than ten years! The aim of the Maroc Vert (Green Morocco) plan is so ambitious that many sector specialists greeted it with reserve when it was announced. However, it has to be admitted that strong dynamics has been set up in the citrus sector in hardly two years. According to professionals, about 4 million trees—nearly 10 000 hectares—were planted or replanted in the last season. And the trend seems to be continuing. Seedling are reserved for the next two years at the largest nurseries in the country, some of which have tripled their production. Does this mean that production will attain the 3 million tonnes in 2020 according to the plan? It is of course too early to answer the question but it is clear that the Moroccan harvest will increase substantially in the coming years.

A clear target for the sector and strengthened support structures

The re-launching of Moroccan citrus production was already latent before the Maroc Vert plan was set up. After a long dull period, the privatisation of public land held by the SOGETA gave a first burst of energy in the mid-2000s. However, the setting up of the plan accelerated the movement. First, it made it possible to give the sector a strate-


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gic view in the form of clear and coherent lines of development within the framework of a 'contract-programme' signed in April 2008 by the state and professionals. Upstream, the main objective is the development of the production base by increasing the area under citrus and by renewing numerous plantations that are ageing and/or grafted on sour orange rootstock that is susceptible to tristeza. The other line of work in production is saving agricultural water, usually a scarce resource, by means of micro-irrigation. Thus in the Souss region, the least well endowed with 'blue gold', only renewal operations should be carried out. Most of the increase in area will be in the Gharb and the Meknès region. The priority downstream is the development and modernisation of packing facilities. The Maroc Vert plan also lays emphasis on supervision structures in the sector, and in particular the setting up of an inter-branch body. This will handle promotion and also research and transfer of technology and the development of suitable logistics (greater use of containerised sea freight).

Attracting accompanying financial measures for growers

In order to attain these objectives, the Moroccan government has set up measures consisting of direct financial incentives. However, in order to structure the sector better, only producers who have chosen to group in a 'volume aggregation' entity can profit from them fully. In this framework, investments in micro-irrigation by small growers receive a subsidy of 100% and the others receive 80%. The sum of DH 12 000 per hectare (about EUR 1 000) is planned to

Maroc Vert Plan — Targets for the main regions

hectares	2020 target	Evolution since the 2006 census
Gharb	39 300	+ 23 100
Souss	34 000	+ 1 000
Oriental	19 400	+ 4 900
Tadla Azilal	16 200	+ 4 200
Marrakesh	9 100	+ 3 700

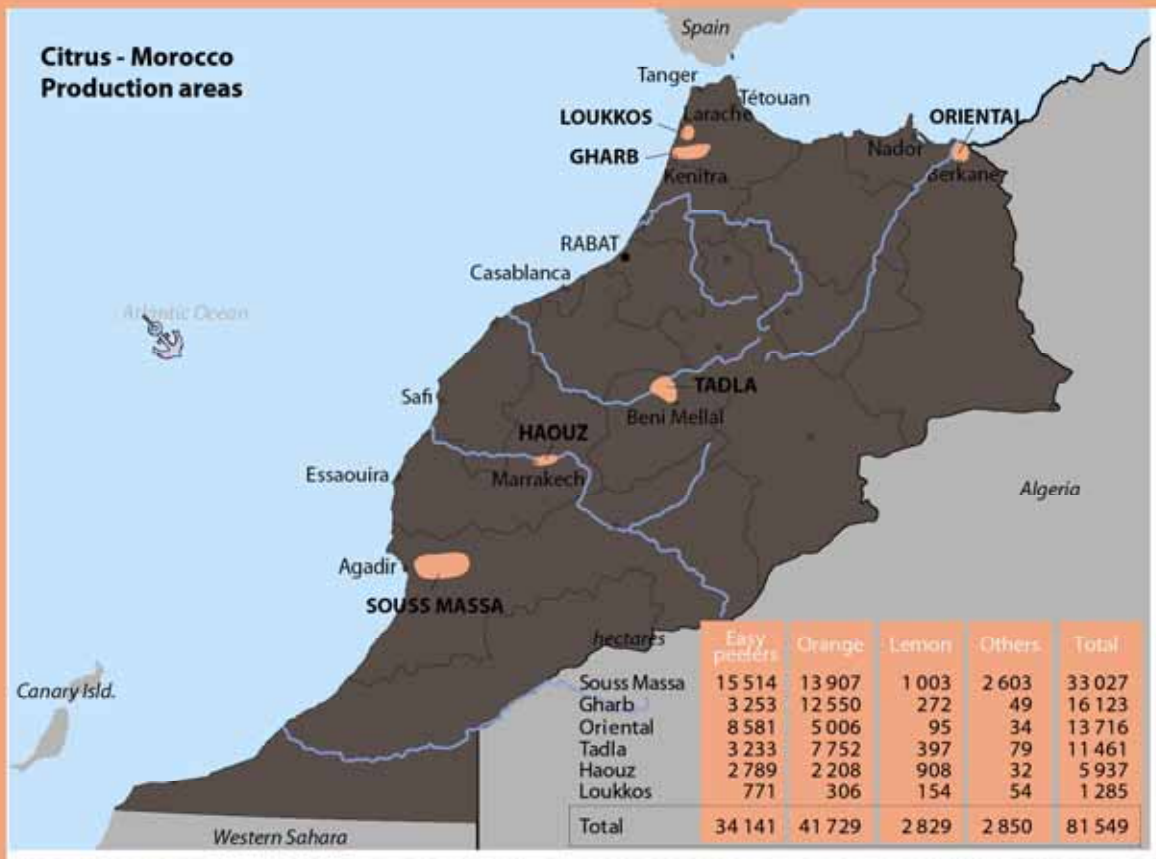
Source: ADA

Maroc Vert Plan — Main targets

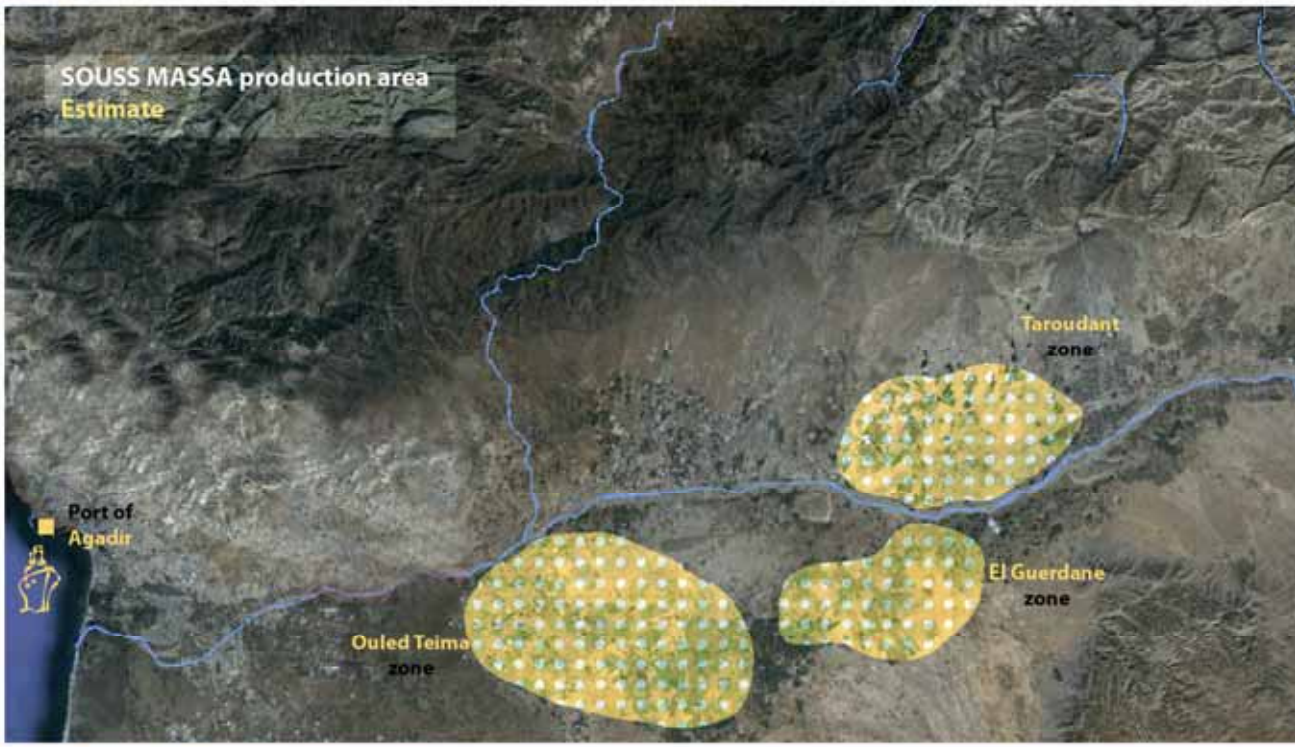
	Present situation	2020 target*	Observations
Areas	80 000 ha*	110 000 to 115 000 ha	Renewal of 20 000 to 30 000 ha
			Rationalisation of 10 000 to 15 000 ha
Production	1.6 million tonnes**	2.8 to 3.0 million tonnes	
Outlets			
local	1.0 million tonnes**	1.1 to 1.2 million tonnes	Growth of population and incomes
export	0.5 million tonnes**	1.3 to 1.4 million tonnes	Regaining the EU market (two thirds of the markets in the West and the East)
			Accompaniment of growth in Russia and Canada
			New markets
processing	0.1 million tonnes**	0.4 million tonnes	Relaunching of the NFC juice chain for export to the EU and sale on the domestic market
Diversification of the range			Lemon and grapefruit for domestic and export markets

* source ADA / ** average 2009-11 / Source: CLAM

CITRUS IN MOROCCO



	Easy peelers	Orange	Lemon	Others	Total
Souss Massa	15 514	13 907	1 003	2 603	33 027
Gharb	3 253	12 550	272	49	16 123
Oriental	8 581	5 006	95	34	13 716
Tadla	3 233	7 752	397	79	11 461
Haouz	2 789	2 208	908	32	5 937
Loukkos	771	306	154	54	1 285
Total	34 141	41 729	2 829	2 850	81 549



16th producer in the world with an increasing harvest of
80 000 ha cultivated with strong dominanc
12 000 farmers with scattered holdings (80% of farms tot
Disparate producti

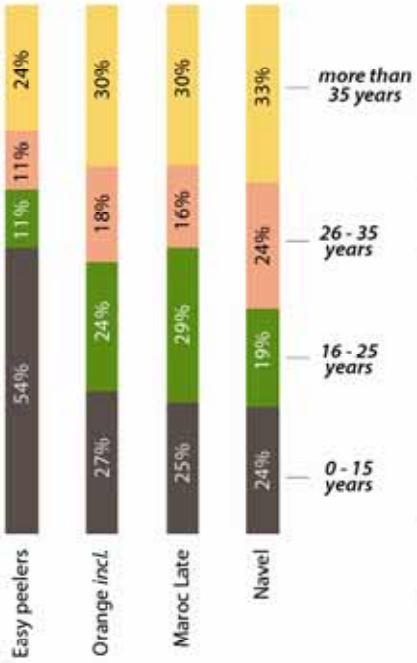
PRODUCTION

Citrus - Morocco
ition of the planted area

Hectares

Clementine	24 631
Nour	5 678
Total clementines	**30 309**
Ortanique	569
Nova	652
Afourer	723
Others	1 888
sy peel. excl. clem.	**3 832**
Total easy peelers	**34 141**
Naveline	1 716
Navel	12 538
Navelate	1 762
Total Navel group	**16 016**
Blood Washington	2 269
Other blood oranges	237
otal blood oranges	**2 506**
Salustiana	1 226
Valencia Late	21 480
Hamlin	230
al orange for juice	**22 936**
Others oranges	271
Total oranges	**41 729**
	2 829
	76
	2 775
	81 550

Citrus - Morocco
Plantation age



Source: EACCE, professional sources

1.7 million tonnes in 2010-11
e of oranges and easy peelers
al less than 5 ha)
vity: 20 to 40 t/ha

FINE

A variety from Algeria related to all the clementine varieties that have been developed. The pulp is soft and melting and its organoleptic characteristics are optimum thanks to a good juice content, an ideal sugar:acid ratio and a high aromatic compound content. However, the fruits are small but this can be corrected by good cultural practices.

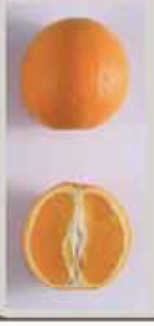
NOUR

'Nour' is a true clementine, the result of a mutation of 'Cadoux' found at Ouled Teima in the Souss.
The fruits are of average size and often have a characteristic small collar. The peel is a strong orange colour, rough and fairly thick but easy to remove. The flavour is sweeter and less acid than that of 'Fine' clementines.

NADORCOTT

This natural hybrid of 'Murcott' originated in Morocco. The fruits are medium-sized to small and easy to peel, like clementines. The shape is irregular and slightly flat, like 'Murcott'. They ripen late and are seedless. The pulp is soft and melting with a large proportion of juice and acids, giving it a clearly characteristic taste.

MAROC 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 Valencia Late (from Spain) 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.

Graphics: Cirad-FruiTrop - Chez Vincent

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facilitate purchases of certified plants and purchases of agricultural machines receive a subsidy of from 30 to 50% (30% for a tractor for example). Likewise, the state undertakes to cover 10% of the cost of the modernisation of packing stations with a ceiling of DH 4.75 million per project (about EUR 400 000). The capital aspect of financing has not been forgotten as in agreement with the state, the Crédit Agricole bank can lend DH 4.8 thousand million during the period 2009-2013 to support fruit and vegetable sector projects.

Private investors participating so far

Support from the private sector is also necessary for the Maroc Vert plan to function. In contrast with the part devoted to production for the domestic market, state participation for export crops such as citrus is limited to the incentives mentioned above. Thus most of the investments must be covered by Moroccan or foreign investors. Why have they found the plan attractive? Quite simply because Morocco has many assets for citrus growing. The privatisation of the SOGETA land had already demonstrated the confidence in Moroccan citrus growing. The large EU market is very close and soil and climate conditions are right for the production of a reference range of easy peelers and oranges under good cost conditions. It will thus be understood why even Spanish growers have decided to set up in Morocco.

Considerable growth prospects on the domestic market

While investors have clearly come out in favour of the plan, will the market do the same? This is an important point as even if the objective of an additional 1.5 million tonnes is not attained, the supplementary volumes to be sold should be far from negligible. The Moroccan domestic market has undoubtedly the main large sales potential. This is shown by its increasing competition with exports in recent years, with producers finding more immediate profitability that is safer and sometimes better than in Russia or in Europe, especially for oranges. Estimated domestic sales were 700 000 to 800 000 t in the mid-2000s and have now reached or even exceeded a million tonnes in the last two seasons. And this dynamics should continue: the simple continuing of population growth (an increase of 3 million since 2001, that is to say + 10% in ten years) should result in an increase in consumption of nearly 100 000 t by the end of the decade, without allowing for the effects of the increase in the standard of living. The increase in tourism is also a favourable factor to be integrated: the number of visitors has doubled in a decade, approaching 9 million, and the country plans to welcome an extra 10 million tourists by 2020.


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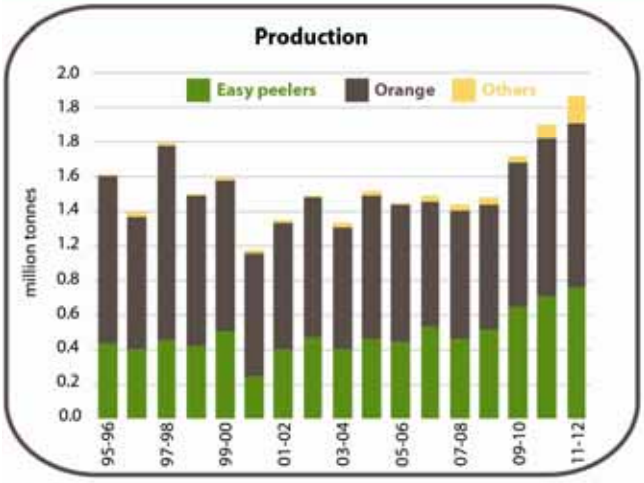
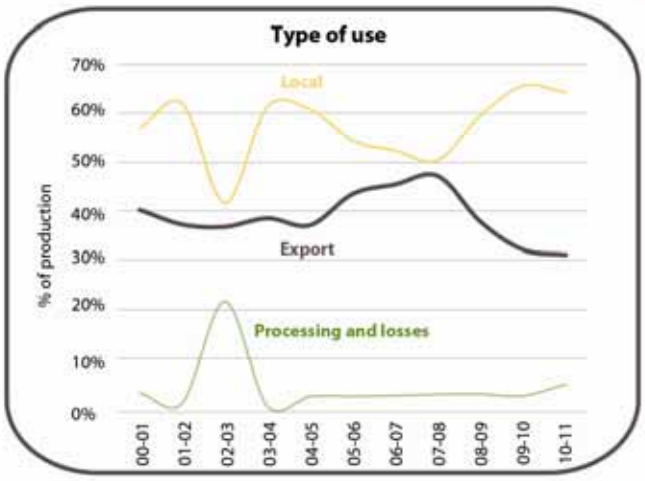
CITRUS IN MOROCCO EXPORT

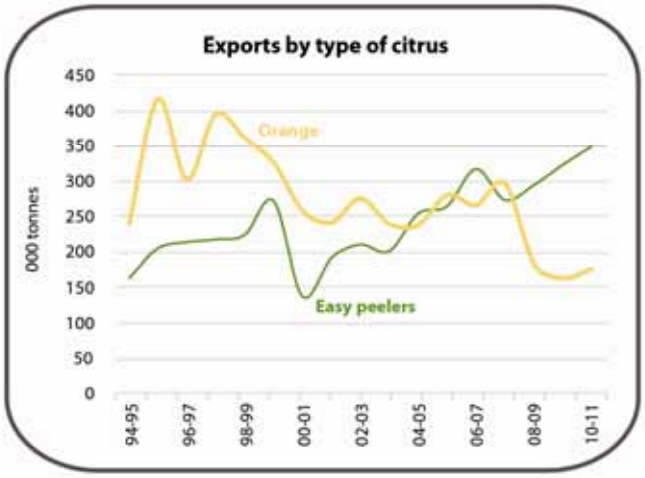




8th world exporter

More than 500 000 tonnes exported in 2010-11

Specialised in easy peelers: 4th world exporter



Citrus export by variety

	000 tonnes	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11
	Total citrus, incl.	**393.3**	**430.0**	**484.5**	**438.0**	**489.9**	**542.7**	**583.0**	**582.7**	**483.1**	**489.0**	**529.5**
Easy peelers	**Total, incl.**	**135.8**	**189.5**	**208.4**	**199.0**	**252.7**	**263.3**	**316.4**	**272.2**	**293.5**	**322.4**	**349.2**
	Clementines	95.8	122.4	139.1	143.1	169.9	189.9	201.2	181.6	180.5	204.1	216.2
	Nour	14.6	39.7	47.6	36.8	63.3	48.2	91.9	59.9	86.7	83.3	79.2
	Nova	4.5	5.3	6.1	1.9	3.9	3.8	3.2	6.0	4.8	6.2	6.5
	Ortanique	14.0	13.3	5.9	8.8	8.4	10.7	8.2	10.4	8.1	5.0	9.3
	Nadorcott	4.7	6.7	7.4	7.4	6.0	9.9	11.6	11.7	13.2	23.8	38.0
Orange	**Total, incl.**	**257.1**	**240.1**	**275.6**	**238.7**	**236.6**	**278.9**	**264.9**	**296.1**	**182.4**	**161.8**	**175.2**
	Navel group	19.0	31.9	35.6	13.5	39.3	23.3	30.3	32.0	25.7	20.4	23.9
	Maroc Late	193.0	153.3	175.5	178.3	135.5	187.6	163.4	192.8	106.9	101.5	100.5
	Salustiana	20.4	27.8	31.2	24.0	29.5	29.5	31.9	28.1	19.3	20.0	25.2
	Blood	24.7	27.1	33.3	22.9	32.2	38.5	39.4	43.2	30.5	19.9	25.6
	Lemon	0.0	0.0	0.0	0.0	0.1	0.0	0.4	13.1	6.0	5.0	5.1
	Grapefruit	0.3	0.4	0.5	0.3	0.5	0.5	1.2	1.3	1.2	0.0	0.0

Source: CLAM, EACCE, various professional sources

(Graphics: Chez Vincent - Cirad-FruiTrop)

A Moroccan production model well suited to markets in countries with an intermediate economic level

Nevertheless, most of the additional quantities should be channelled for export. The Maroc Vert plan aims at placing 1.3 million tonnes per season on the international market, that is to say double the quantities shipped in the best years. Is this realistic? Morocco possesses assets to be able to profit from the scope for growth in Eastern Europe. It is already well installed on these markets where consumption is still less than 2 kg per person per year less than that of the non-producer countries in Western Europe. It is true that Morocco is not alone. But in comparison with the other suppliers with competitive cost prices it can supply a broader, better quality varietal range that matches the increasing expectations of the large retail chains that handle an increasing proportion of sales in these countries. This is a strong point that can counter-balance Turkey's excellent position in terms of logistics and secure payments or the more solid strong points of Egypt and China in terms of production costs. These countries do not seem to be able to match these criteria at the moment because of more limiting soil and climate conditions or the choice of a production model with more emphasis on volumes. There remains Spain, a recent competitor on these markets that have become one of its development priorities in the light of the sluggishness of Western Europe. Spanish exporters demonstrated this last season by shipping 60 000 t to Eastern Europe, double the volume of that of the preceding season. The question of production cost will be determinant in the duel that might take place between Spain and Morocco on these markets, which remain less fussy than those of Western Europe. Given the difference in labour costs, it is difficult to imagine Spain being on the same footing as Morocco.

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Western European markets: a necessary but difficult reconquest...

Although the potential is substantial in Eastern Europe, a return to the Western European markets seems essential in the light of the volumes to be exported. Is this possible? We know that Morocco's market share in these destinations has halved in a little more than ten years and in recent years only 200 000 t of citrus of all kinds has been sold. The question of the difference in competitiveness with Spain, which is omnipresent on these markets, arises once again. However, unlike the case of the Eastern markets, this difference alone will not enable Morocco to take the advantage without at least matching the quality—in the broad sense-—of production with that of Spain. Although Morocco is already equal in terms of certification and the intrinsic quality of the fruits shipped, the question of the length of the range is of crucial importance. The Moroccan range today is smaller (grapefruit and lemon are practically absent) and much more so in easy peelers and oranges. Although the easy peeler varieties from Morocco are very competitive from mid-season onwards ('Fine' clementine, followed by 'Nour' and 'Nadorcott'), there is a shortage of early fruits. As regards oranges, although 'Maroc Late' is a reference for juice, hardlky any dessert oranges are exported, whether at the beginning, in the middle or at the end of the season. This makes it difficult for Morocco to establish lines at the beginning of the season and handle the category management sought by the major retailers that handle most sales of citrus.


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Towards a very pertinent varietal range of easy peelers

Will the Maroc Vert plan make it possible to achieve balance here? It can be regretted that the measures for guiding production in varietal groups are not sufficiently astute. However, the varietal range of easy peelers should become very relevant in the years to come. For reasons of immediate profitability, most planting efforts are concentrated on this varietal group (70% of the areas planted according to estimates by certain professionals). Although much preference has been given to late varieties like 'Nadorcott', many growers have also emphasised the early clementine category by choosing particular varieties ('Orogrande') or by using rootstocks that bring early fruiting.

Work remains to be done in the other varietal groups

Work does not seem to have gone as far in oranges, a varietal group forming a limited proportion of planting or replanting so far. Beyond the choice of varieties, the problem stems more from producers' desire to invest in oranges. Financial returns today are clearly in favour of easy peelers. However, the future profitability of the latter is also linked to the range effects, to which oranges and other citrus groups also contribute. The large groups need these complementary features, given the volumes that they handle, and shouldn't they include oranges as a strategic axis in their plantation programmes? In addition, if the prospects are not as ample as forecast on the international market, the domestic market is a reliable fall-back solution. Finally, this is also coherent with the Maroc Vert plan for launching the juice sectors, which is currently small, and this could also be profitable given the sanitary problems in Brazil and above all in Florida. Clearer state incentives for the well-staggered production of dessert and juice oranges would perhaps be a determinant argument.

Citrus on the traces of tomato thanks to the Maroc Vert plan?

The Maroc Vert plan is considerably increasing Morocco's firepower in exports by both developing and modernising production. We shall see in due course if the very ambitious goals set for 2020 are attained. Some recurrent problems such as landholding (divided, scattered plots and the problem for investors of joint ownership of land) are potential brakes, like the effects of the world economic downturn on loans. However, the dynamics is assured of continuing in the short term given the reservations of seedlings in the nurseries.

The essential commercial success of this strong export-linked plan will depend to a great extent on Morocco's capacity to give its production model a more pertinent varietal range while making the most of its comparative advantages in terms of cost price. This change that will enable the large Moroccan groups to match the best international standards has started, but only in certain areas such as easy peelers. The state should provide stronger encouragement, in particular by a more targeted subsidy policy that is more favourable for oranges and other citrus fruits. These are similar bases to those used by Moroccan tomato professionals in their conquest of the European market in a more difficult context of regulations. Their counterparts in the citrus world have the potential to succeed a similar challenge ■

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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: *Liberibacter africanum, L. asiaticum***	Citrus canker **Bacterium: *Xanthomonas axonopodis* pv. *citri***
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 (*Aphis gossypii, Toxoptera citricida*).	Psyllas (*Diaphorina citri, Tryoza erytreae*).	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 *Ceratitis*, *Anastrepha*, *Dacus*, *Bactrocera*, etc.**	Thrips **Thysanoptera: thripidae. *Scirtothrips* spp. (*S. aurantii*, *S. citri*, *S. dorsalis*)**	Diaspine **Hemiptera: Diaspididae. Genera *Aonidiella*, *Unaspis*, *Chrysomphalus*, *Cornuaspis*, etc.**
Distribution	American continent: *Anastrepha*. Africa: *Ceratitis*, *Dacus*. Asia-Pacific: *Bactrocera*.	Variable according to the species. Present in the Mediterranean area: *Tetranychus urticae*, *Panonychus citri*.	Variable according to the species. Present in the Mediterranean area: *Aonidiella aurantii*, *Cornuaspis beckii*, 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 cultivation

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 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.

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, degenerescence 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.

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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 then 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.

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Main citrus varieties

photos © Régis Domergue

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 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.

Orange

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

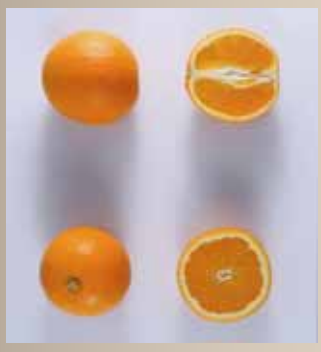
A round to oval dessert orange with a strongly developed navel. The peel is grainy, thin and fairly well coloured. The flesh is crisp, fine and not very juicy. Early cultivars (Naveline) and late cultivars (Navelate, Lane Late) in the Navel group are available on northern hemisphere markets from October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



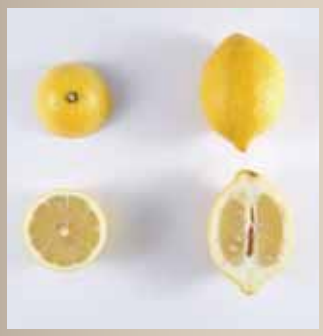
Lemon

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.

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.



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.

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.

Citrus harvesting and storage

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.

Fugal 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.

Post-harvest diseases	Blue mould ***Penicillium italicum***	Green mould ***Penicillium digitatum***	Black rot Anthracnose ***Alternaria citri***	Brown patch ***Glomerella cingulata*** (= *C. gloeosporioides*)	Brown rot ***Phytophthora* 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).