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FRuiTROP

English version

CLOSE-UP: GRAPEFRUIT

Mediterranean citrus: HLB, a new threat

Sea freight: reefer market heads for the rocks

http://passionfruit.cirad.fr

Grapefruit

A report by Eric Imbert

How is the international grapefruit market faring five seasons after the shock caused by hurricanes to its leading light, Florida? FruiTrop reviews the situation. The drastic decrease in the Sunshine State's orchard output has been seen as a development opportunity that certain large producer countries in the Mediterranean have leaped on. The most pessimistic scenarios, that may well be confirmed in Florida, as is seen in the first article, seems to say that they were right. However, all is not over as consumption figures on the major world markets are not bright and outsider sources of supply are tending to emerge.

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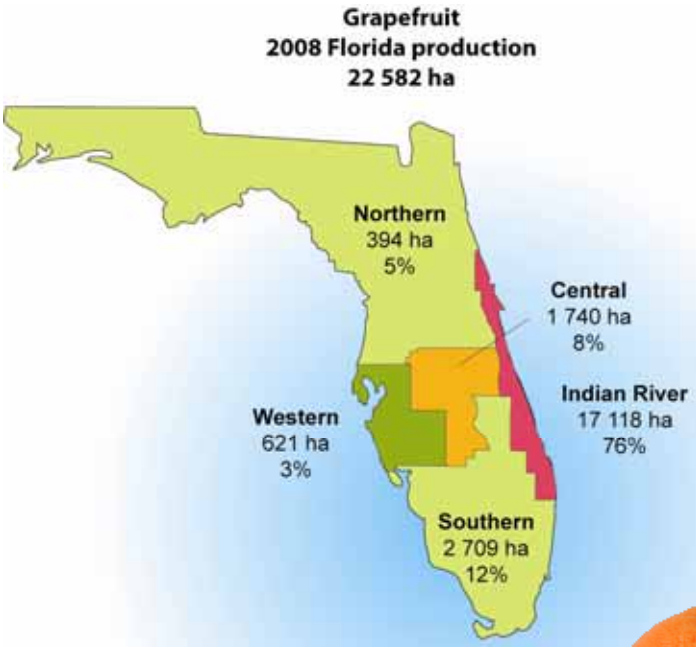
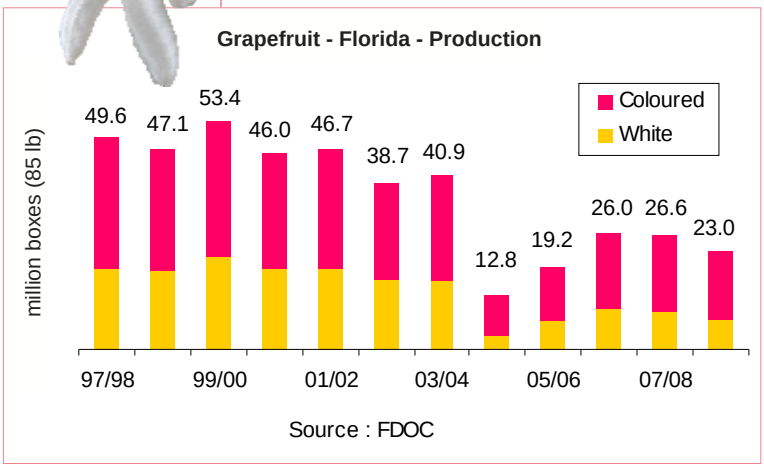
No miracle



It is clear that there has been no miracle and Florida production has only very partially recovered from the hurricanes of 2004 and 2005. Previously some 1.5 million tonnes, the harvest has been less than a million tonnes in recent seasons when there has been no hurricane damage. This is a fall from 40 million to 25 million field boxes measured in the units used by professionals. However, FDOC forecasts indicate that the worst is to come and some analysts say that the survival of the sector is at risk. Already weakened by decreasing profitability and citrus canker, the sector has a new, mortal, enemy with the appearance of greening (HLB), detected in 2005 in the south-east tip of Florida. This bacterial disease spreads very rapidly and is now present in all 38 counties of the state. It is an extremely serious threat as the symptoms are very serious for both trees and fruits. Loss of orchard profitability and then the death of the trees take place in a short, five-year period (see article below). In addition, monitoring of the disease is very difficult and its eradication even harder. The structure of Florida production does not help. Indeed, although plantations are of the commercial type, making monitoring easier, their closeness to or mingling with built-up areas expose the trees to contamination by domestic citrus plants and ornamental species (such as Murraya for example) that potentially harbour bacteria that are very difficult to control.

Dwindling profitability— not only for growers

In addition, the economic aspects of control of the disease worsen a technical situation that is already very bad. Controlling greening is expensive, very expensive. In a recent



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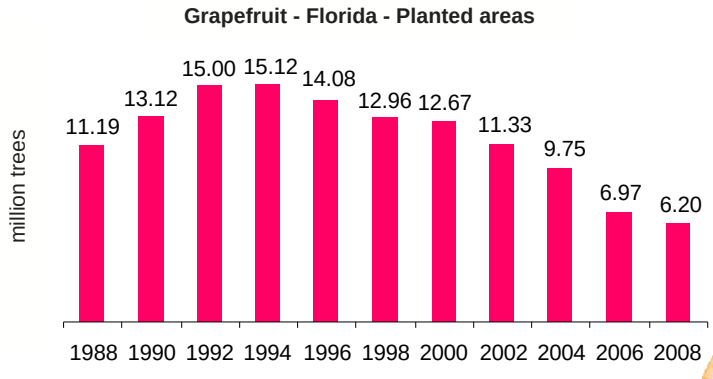
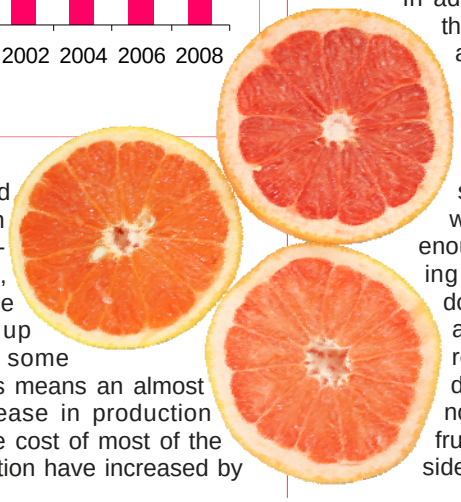


study, FDOC estimated extra costs involved in the bimonthly monitoring of plantations, chemical control of the vector and grubbing up and replanting to be some USD450 per acre. This means an almost unbearable 50% increase in production costs, especially as the cost of most of the other factors of production have increased by 30 to 50% and fertiliser prices have rocketed. According to a recent study, the prices of the four main fertilisers used in citrus growing have increased from USD 300-400 USD per tonne to USD550-650 and triple superphosphate costs more than USD1000. It is difficult for growers to believe in the future in a context of such a decrease in profitability while there is a risk of more hurricanes and real estate is still an interesting economic alternative.



In addition, profitability is dwindling in the downstream part of the sector, as passing the entire increase in cost prices further on down the line is increasingly difficult. This was demonstrated in the current season. Although the average selling price at the import stage was excellent, it was often not high enough to cover increased purchasing prices, especially as the euro-dollar exchange rate is less favourable than in preceding years. As a result, a number of importers wonder more than ever about the economic interest of trading in Florida fruits, especially as the risk is considerable as firm prices are paid. A

Grapefruit juice: a sour taste

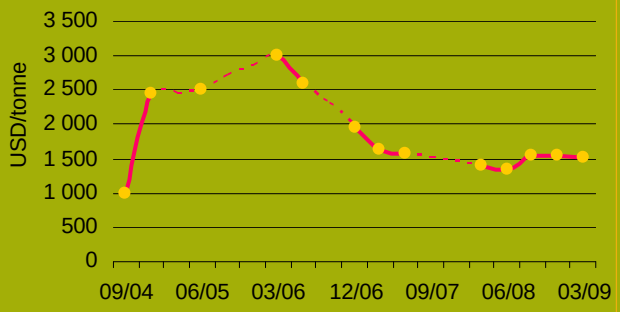
Growers do not have a true, profitable alternative to the fresh fruit market. In spite of a slight movement in early 2008, the price of Florida 587° Brix juice, the Rolls Royce of concentrated juices, reputed for its taste qualities and high soluble solids content, peaks at about USD1 500, far from the USD3 000 reached in early 2006 when the Florida deficit was at its worst. Prices are becoming dangerously close to the low USD1 000 seen before the 2004 hurricanes. Why such stagnation when Florida is still very weak, even if it is the leading stakeholder on this market?

First of all, demand has continued to decrease (see box). The demonstration of potentially harmful interactions between grapefruit and certain medical treatments spread doubt among consumers, especially older larger consumers in the USA. In addition, the price recovery observed in 2005-06 encouraged the beverage sector to replace this juice by cheaper ones in the formulation of certain blends. For example, consumption on the US market halved between the beginning of the decade and the 2007-08 season, falling from over 125 million gallons of SSE (Single Strength Equivalent) to less than 65 million. The emergence of a market in eastern Europe does not compensate the decrease in longstanding consumer countries.

On the supply side, processed volumes have increased considerably after the dizzy plunge in 2004-05 and 2005-06. They are even approaching those of the last average seasons before 2004-05. Larger volumes processed in South Africa, Argentina and Mexico partially make up for the Florida deficit.

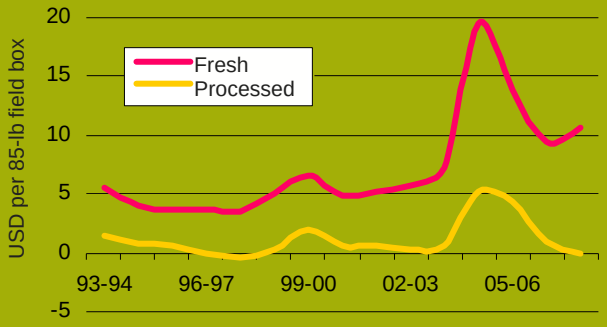
In this context, profitability has shrunk to practically nothing and was even negative in 2007-08 in countries with high labour costs. The single juice market is the only healthy segment. European market demand is still fairly good and allows fairly decent prices: approximately USD600 shipped to Rotterdam (tax unpaid).

Pink grapefruit - Florida - Concentrate 58°Brix
Average price CIF Rotterdam



month/year - Source: FoodNews

Grapefruit - Florida - Margin at production by market segment

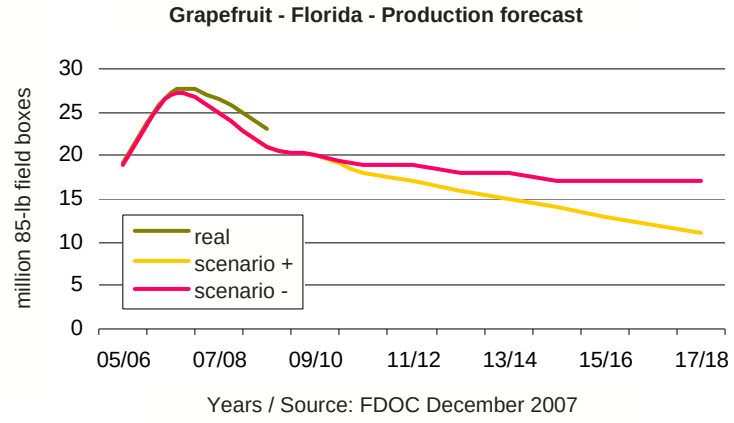


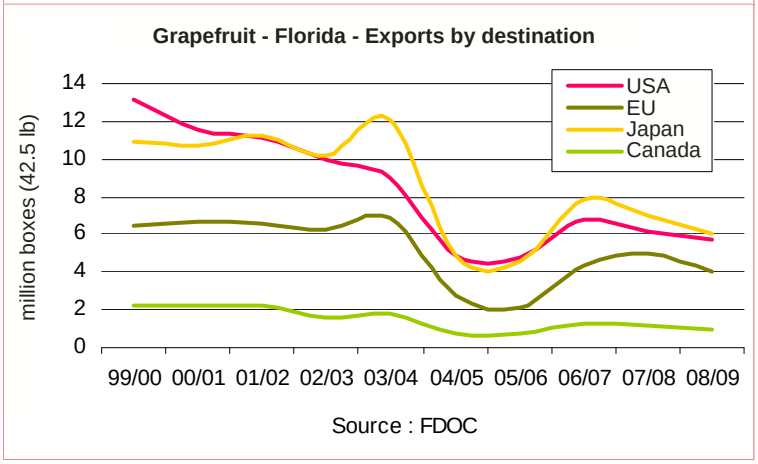
Source : FDOC

Grapefruit — World — Estimate of quantities processed

000 tonnes	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Total	**2 066**	**1 827**	**1 186**	**1 585**	**1 800**	**1 742**
Total Northern Hemisphere	**1 753**	**1 576**	**869**	**1 206**	**1 448**	**1 401**
United States	1 098	1 144	392	629	859	809
Mediterranean	207	182	185	195	202	192
Israel	171	143	157	151	157	144
Turkey	19	24	10	19	15	18
Cyprus	9	8	10	16	15	16
Spain	3	2	2	3	7	6
Mexico	39	69	112	112	80	100
Cuba*	207	4	1	80	112	116
Total Southern Hemisphere	**313**	**251**	**316**	**379**	**352**	**341**
Argentina	106	73	127	130	126	91
Brazil	59	59	59	60	60	60
South Africa	148	119	130	189	166	190

* estimate: 80% of production in 2007 and 2008 / Sources: FAO, CIRAD, professionals

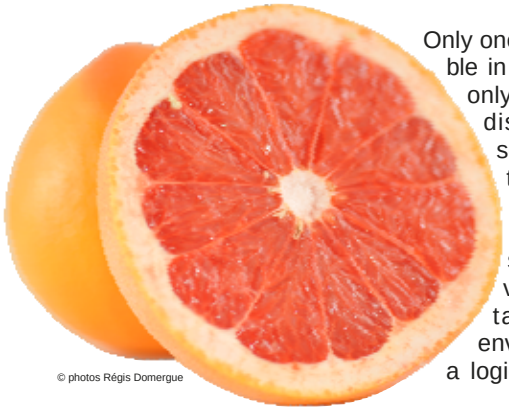




trend for the concentration of a small number of specialist importers working on this source should become confirmed.

All out against greening

Nevertheless, the Florida citrus sector is still fighting and the FDOC is mobilising all its financial resources to fund research. Numerous approaches are being examined: work on disease-resistant plants and work on the vector to limit its ability to reproduce or spread the disease. However, all these methods have the common feature of being fairly long to develop to reach a reliable technical solution.



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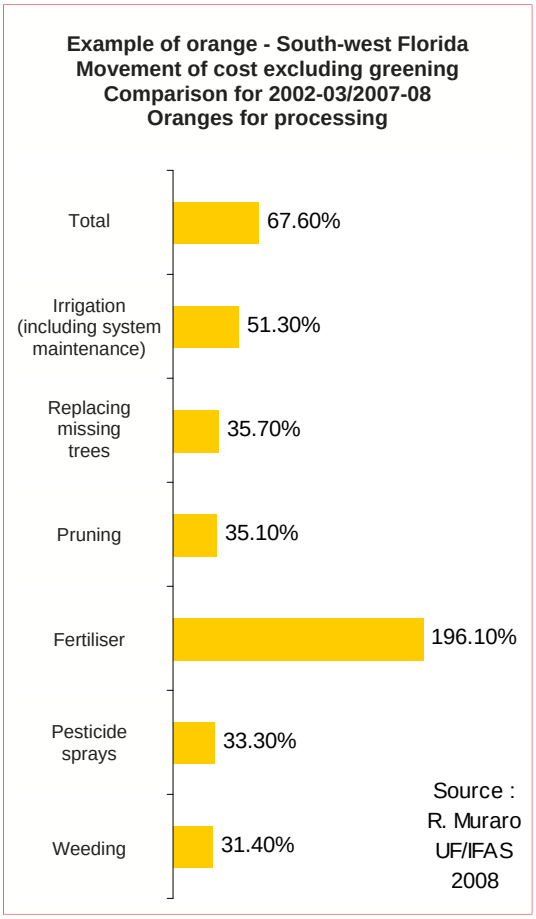
Only one solution seems possible in the short term but has only been mentioned very discreetly by some researchers as it calls the technical and financial foundations of the crop into question. It consists of establishing very high density plantations in a confined environment. The idea is a logical one in fact as it is inspired partly by cropping systems developed by Chinese farmers who have had to face endemic greening for decades.

In any case, FDOC production forecasts do not indicate any recovery. All the scenarios in the latest forecasts show harvests dwindling in the coming seasons and reaching 14 to 17 million boxes in the middle of the next decade. This is another significant decrease but will not call into question the Sunshine State's status of the world's leading producer of high-quality tropical grapefruit ■

Eric Imbert, Cirad
eric.imbert@cirad.fr



The world grapefruit market

Five years on...

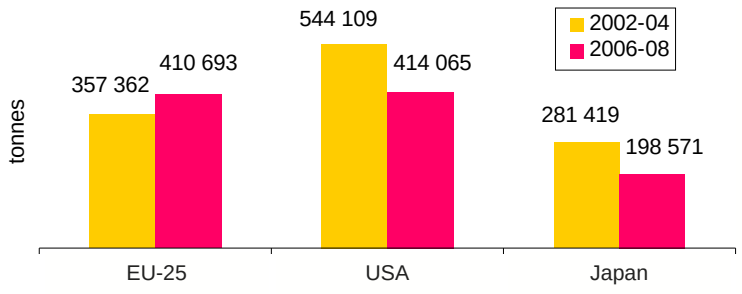
How have the large international markets Europe, Japan and the United States fared after the collapse of production capacity of the world's leading grapefruit supplier? Has consumption followed the decrease in production in Florida or, as one man's joy is another man's sorrow, has the situation benefited the other suppliers that ship during the winter season? FruiTrop has already pointed out in a another article that the top-of-the-range position of Florida would make it difficult for other supplier countries to gain market shares. This has been demonstrated on several markets in recent seasons.

In Japan and the United States, the decrease in production in Florida does not benefit the other sources

Is Florida an irreplaceable supplier for Japan, the second largest market in the world after the EU? Consumption oscillated between 280 000 and 290 000 t before Florida production slumped and has only been 170 000 to 210 000 t in recent seasons. It is true that the Japanese market is closed to a fair number of potential supplier countries for reasons of drastic sanitary and phytosanitary measures. However, it is interesting to see that Israeli exporters, who possess the authorisations to export 'Sunrise' grapefruit to Japan, have not gained market shares even though the prices are more attractive than those of Florida grapefruit. Shipments of 'Star Ruby' stagnated at an insignificant level. Another more disturbing factor is that the volumes of grapefruit sold during the summer have also decreased whereas an increase related to the early end of the Florida season might have been expected. The volumes exported from South Africa, practically the sole source during this period, have not recovered to the 65 000 to 70 000 t observed before the hurricanes, and this is not justified by any decrease in production. This would tend to prove the theory held by many importers that 'Florida grapefruit stimulates grapefruit sales'.

The situation is similar in the United States. Florida grapefruit sales volumes have decreased by a third from about 170 000 t to 120 000 t (from 9 million to 6 million export boxes) and no other player on the market has really profited from the situation. First of all, it should be stressed that consumption dynamics was clearly weakening before the problem of smaller Florida supplies occurred. In this context, no producer states increased their market shares or even sought to do so. Although Texan citrus growers were those most capable of profiting from Florida's weakness, they preferred to invest in less risky crops that give

Grapefruit and shaddock - Evolution of the market releases in the three main world markets



Sources: Eurostat, USDA, US and Japanese customs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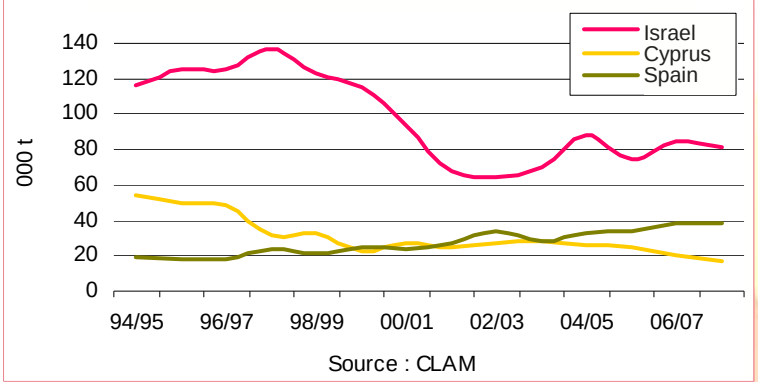
more immediate returns than grapefruit, especially as a fair number of growers are old and have difficulty finding farmers to replace them. In addition, urbanisation and scarce irrigation water limit scope for increasing the orchard area. Thus, production has not increased significantly and the area concerned is stagnant at 18 500 acres, that is to say about 7 500 ha. Planted areas have even continued to shrink in California and Arizona, where the production calendar is different to that of Florida. And imports from third countries have remained practically nonexistent.

A fairly dynamic European market in the midst of total structural change

In contrast with the two large markets mentioned above, sales volumes are continuing to increase in Europe thanks to growing consumption in the east. Russia is still a driving force, probably importing more than 90 000 t in 2007-08 in contrast with 45 000 t in 2004-05. Ukraine and Romania, which joined the EU in 2007, have also remained very dynamic markets with imports of about 12 000 t and 35 000 t respectively in 2007-08. As for EU-25, the increase of imports exceeding 400 000 t in 2006-07 and 2007-08 is to be applauded when compared to the strong decrease in trade on the other large markets. First, EU-15 volumes in the winter have returned to some 250 000 t, which is comparable to the figure observed before Florida production slumped. And then imports by the eastern European countries that joined the EU in 2004 have displayed average growth of around 10 000 t in the last three years, narrowly exceeding 100 000 t in 2008.

Grapefruit - Export of the main Mediterranean suppliers



Source : CLAM

Although the volumes sold have moved little, the trade landscape has changed completely. A detailed review and forecasts by source is necessary.

Israeli exporters ready to further increase their market shares in western Europe

Israel is one of the main countries to have gambled on the possibility of gaining market shares. This has been only a partial success as whereas shipments to the EU have increased well, reaching some 60 000 t (+ 15 000 to 20 000 t in comparison with the period preceding the problems in Florida), prices returned to pre- 2004-05 levels after a short-lived increase. Thanks to larger water resources provided by recycled urban water and given the gap left by Florida in the EU, the main market for Israeli grapefruit, a large amount of planting was carried out from 2004 to 2008; this especially concerned the 'Star Ruby' variety. With an estimated 2 800 ha of coloured varieties in 2009, the Israeli grapefruit sector thus possesses production potential of about 140 000 t, 40% more than the present level.

Might the return of the problem of scarcer water resources after several seasons lead to a new decrease in planted area, as was the case in the 1990s, a dark period for Israeli citrus growing? USDA considers that there is a shortage of some 100 million cubic metres to cover the country's total requirements estimated at 1.8 billion cubic metres. The government has therefore applied once again a strong reduction to the quotas allocated to farming, held responsible by certain politicians for the mobilisation of a more than substantial proportion of this rare resource to contribute less than 5% of the GDP. In this context, it would seem that further massive grubbing up of citrus plantations is inevitable (USDA puts the figure at about 1 000 ha). However, this should mainly affect the least profitable species. The victims of this reduction in area should be white grapefruit, more than 80% of which are sold to the juice industry at less than cost price, 'Sweetie', suffering from lack of consumer interest, and 'Shamouti' orange for the same reason. The economic performance of 'Star Ruby' is still satisfactory. Profitability is generally excellent at the beginning of the season, benefiting growers in Upper Galilee where the crop is early. But should a fresh increase in area be expected in the coming seasons after a period of stoppage of planting in 2008 for religious reasons? There are doubts about this. In addition to the water problem, recent seasons have been less profitable than 2004 and 2005 when the Florida deficit was at its worst, and the somewhat disappointing results of the 2008-09 should not change the situation.

An easier crop than lemon in Spain

Spanish growers are also counting on increasing their presence on the EU market. The figures for recent seasons confirm an increase of some 5 000 to 10 000 t in Spanish exports to EU destinations and these have exceeded 35 000 t in recent years. Planted areas have increased in the Murcia region, the main Spanish production centre, and to a lesser extent in Andalusia (Huelva/Seville zone). The increase is beginning to have an impact on production which, according to professional sources, increased from some 50 000 t in preceding seasons to 60 000 t in 2008-09. Profitability is also satisfactory, even though performance in the last season was not as good as in preceding years. However, it is still distinctly better than that of the other citrus species, and some growers have thus top-grafted their orchards—especially lemon, the speciality of the Murcia region and for which the market is suffering from chronic over-supply. The markets have responded to the increase in supplies from Spain. Interest in eastern Europe decreased this season. However, Spanish operators strengthened their positions in western Europe, in particular on the French market thanks to successful sales to certain supermarket chains. However, the enlargement of the planted area seems fairly moderate, even if figures to confirm this are lacking. Grapefruit is not part of the tradition of most growers and the domestic market is more than limited. In addition, using of sorting rejects, forming more than 20% of the crop this season (a windy one), is a problem. Juice processors in the region are not interested and there is no other cash-paying alternative.

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Turkey: the future is in the east

With strongly developing production and comparative advantages in terms of production cost, Turkey was well-placed in 2004 to claim a large slice of the cake left by Florida. Exporters in Cukurova, the main production area south of Adana, revealed their ambitions clearly in the 2005-06 season when they more than doubled their shipments to western Europe. However, three seasons later, the shipments have decreased or rather changed target. Shipments to eastern Europe, both within and outside the EU, have rocketed at the expense of those to the western part of Europe which have returned to their initial level. What are the reasons for the change? The main one is economic as analysis of customs values shows that the prices fetched in Russia, the main eastern European market for Turkish grapefruit, and in the west are very similar. In addition, payment is on a firm basis, often via an on-the-spot representative of the exporter, a further guarantee of payment. Finally, transport costs are smaller and requirements less strict, especially as regards certification. It is true that increasingly severe MRL standards on the Russian market caused a scare among exporters. However, the authorities in both countries reached a bilateral agreement allowing the resumption of trade and making the future less worrying. In addition, even if Russia is still a prime destination taking 25 to 30% of exports, other eastern European countries have strong import levels and good growth (see table). Stress is also laid on neighbouring countries in Central Asia (Georgia already imports about 1 000 t) and the Middle East (Iran, and especially Iraq which could become once again the large market that it used to be before the wars of the 1990s and 2000s). A switch in the situation and a massive return of Turkish exports to western Europe thus seem unlikely, especially as the strong increase in production seems to be over. The harvest of some 60 000 t in the mid-1990s seems to have stabilised at close to 180 000-200 000 t (approximately 160 000 t last season because of frost). The varietal range is changing in favour of red varieties ('Star

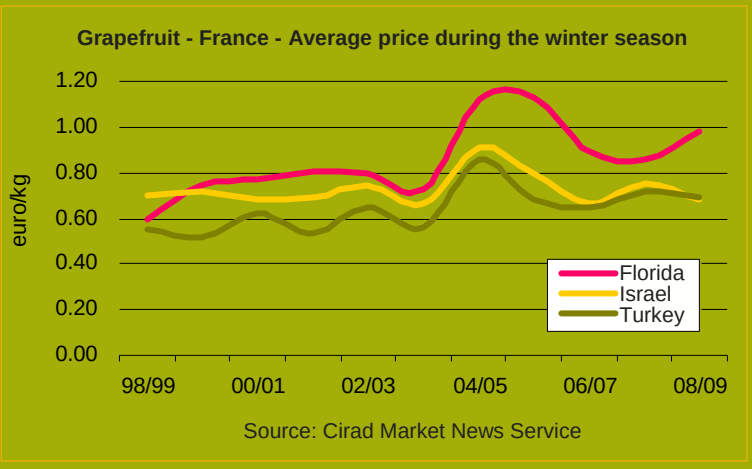
Grapefruit - Turkey Main importing countries (tonnes)	
Russia	**34 973**
Romania	**17 452**
Poland	**10 739**
Ukraine	**8 979**
Bulgaria	**8 259**
Germany	**5 059**
Czech Rep.	**4 040**
Netherlands	**3 364**
Saudi Arabia	**3 284**
Belgium	**2 998**
Serbia	**2 437**
Hungary	**2 417**
Iraq	**2 007**
Iran	**1 891**

Source: AKIB - from October 08 to April 09

Review of the 2008-09 winter season: disappointing from every point of view

Grapefruit — EU-25 — Estimated marketed volumes by the main suppliers			
Tonnes	**2008-09**	**2007-08**	**%**
Florida*	62 000	77 000	- 19
Israel**	65 000	61 000	+ 7
Spain	31 200	31 550	- 1
Turkey	40 000	42 600	- 6
Total grapefruit	**198 200**	**212 150**	**- 7**
China	60 000	49 400	+ 21
Total grapefruit + shaddock	**258 200**	**261 550**	**- 1**

* Estimate based on 4 million boxes instead of 5 (17kg) / ** Estimate : 4.8 million boxes exported world-wide against 4.3 / EU = 85% of world volumes / Sources: professionals, CIRAD, Eurostat



Source: Cirad Market News Service

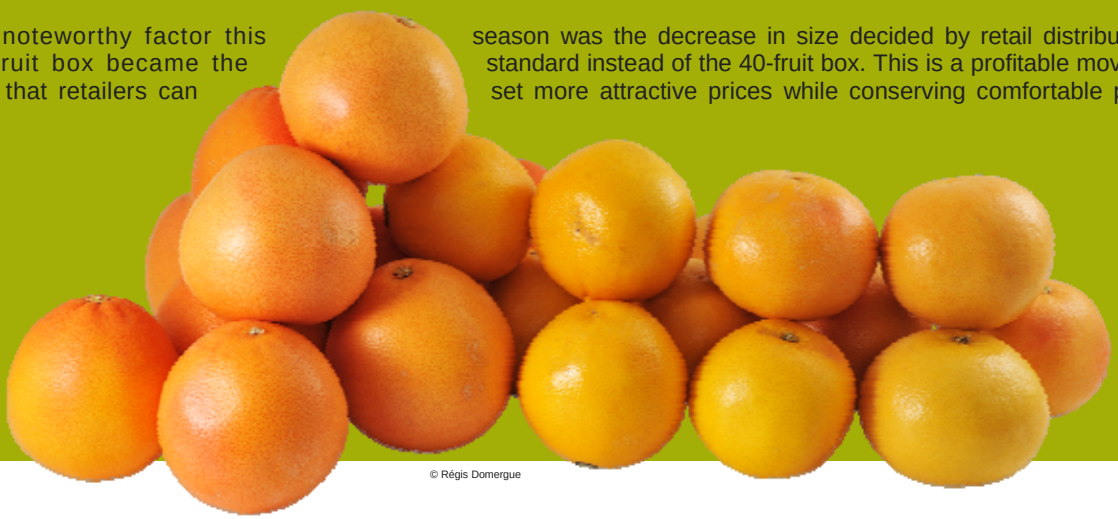
It is still too soon to obtain the final EU import statistics. However, our estimates based on professional sources indicate that the volumes of grapefruit released on the market were down by some 5 to 10% (the cumulated figure for Florida, Israel, Spain and Turkey was some 200 000 t). However, the total is similar to the previous year if imports of shaddock from China are included. The movement of market shares by source is a clear illustration of the major trends described in this article.

The results for Florida are not positive. First, the volumes sold were distinctly smaller than in the two preceding years. However, the return to a normal start of season date (early October) made the sales calendar longer than last year. But production dipped and poor packing yields at the end of the season limited scope for prolonging sales. In addition, a strong increase in cost price and a less favourable euro:dollar exchange rate than in other years made some importers very cautious. Second, even though the very good level of quay prices gives the impression of a season that was positive in economic terms, this was not the case as the cost price had risen strongly.

However, this situation did not benefit most of the other Mediterranean sources and these display fairly poor balances. The twin features of the ground lost by Turkey, concentrated more than ever on the eastern European markets, and the structural decline of Cyprus gave an extra opportunity to Israel and Spain. However, although these two sources performed satisfactorily in terms of volume, price conditions were distinctly less favourable than in 2007-08.

What factors explain this blanket general performance? The first is probably consumption. Although the volumes released were very similar to those released until April last year in France (the data for May are not yet available), consumption seems to have displayed a record decrease in certain countries like Germany (with a dip of more than 10% according to consumer panel sources). The economic downturn does not seem to be the only reason. The market was strongly supplied with competing fruits and probably played a role too. A large European apple crop, large orange and easy peeler crops in the Mediterranean followed by stone fruits slowed grapefruit sales strongly from May onwards. The continued increase in volumes of Chinese shaddock also had an effect. Arrivals reached record-breaking levels, probably exceeding 65 000 t in EU-27.

Another noteworthy factor this season was the decrease in size decided by retail distributors. The 48-fruit box became the standard instead of the 40-fruit box. This is a profitable move as it means that retailers can set more attractive prices while conserving comfortable profit margins!



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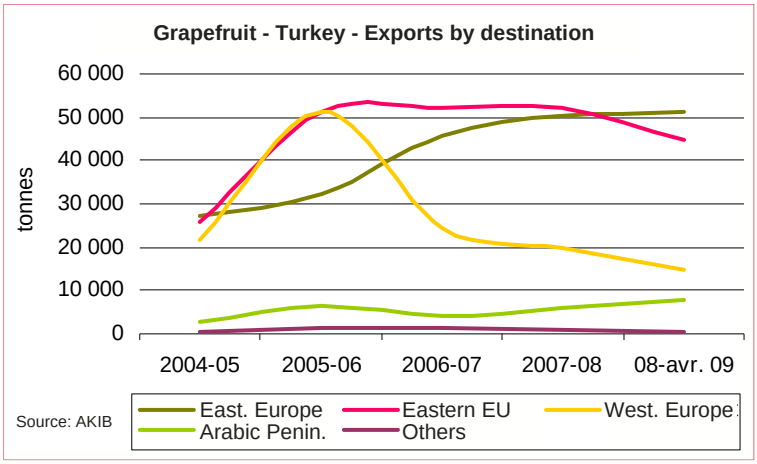


Ruby and also 'Rio Red') at the expense of pink varieties and above all white varieties that are not very profitable as the price paid to the grower was a third of that for red fruits this season. Thus, only a limited number of specialised importers working with brands forming references for this source should continue to ship to western Europe.

Cyprus is running dry!

The present approach of Cypriot growers does not seem to consist of joining the race for EU market shares but rather of saving what is left of the citrus sector in Cyprus. It is not very profitable as labour is increasingly expensive and the crop is now declining, a feature aggravated by worsening drought in recent seasons. The grapefruit sector is particularly hard-hit as the varietal range is anachronistic and still too broadly based on 'White Marsh', for which outlets are ever narrower. Exports were still larger than 30 000 t at the end of the 1990s but hardly more than 15 000 t in the last two seasons.

Even the authorities consider that citrus production might well fail to recover from a drought that has now lasted for four decades.

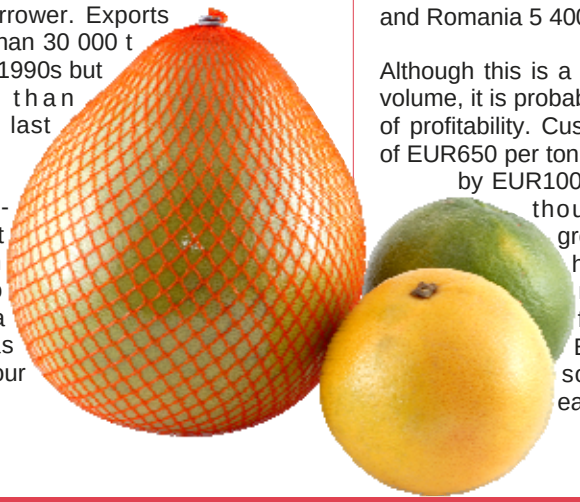
Corsica: determined to be different

These have been profitable times for Corsican professionals. It is true that production has been stable and limited at about 3 500 to 4 000 tonnes, but the rehabilitation of old orchards should allow a slight increase in volumes in the medium term. However, professionals have strengthened their position as regards French retail chains. First, sales have been rationalised and centred on GIE Corsica Comptoir which handles about 80% of supply. In addition, the original quality approach set up to match the climatic constraints of the island has received recognition. One of the key points of the specifications is the late start of the season in April as the production cycle is comparatively long because of the cool winters. This differentiation should soon be consolidated by a PGI (application to be made this year).

China: playing on novelty

China is number 1 among the big winners, taking advantage of both the shortage of fruits from Florida and an innovative fruit, a variety of shaddock going by the commercial name of 'Honey Pomelo'. Launched in 2002-03 by the Carrefour group in France, volumes rocketed to 50 000 t in 2007-08 and exceeded 65 000 t in 2008-09, making China probably the leading supplier of the European market! Another interesting point is that the fruit is no longer reserved for the western European markets but is beginning to gain ground rapidly in eastern Europe, with the Baltic countries importing more than 2 000 t last season, Poland nearly 1 000 t and Romania 5 400 t!

Although this is a fine performance as regards volume, it is probably not quite as good in terms of profitability. Customs value was an average of EUR650 per tonne until 2006-07 and then fell by EUR100 in two seasons. Thus, even though the 2 million tonnes grown forms a practically inexhaustible source, imports might not grow at the same frantic rate in western Europe in the coming seasons. But then there is still eastern Europe...



Grapefruit — China — EU-15, EU-25 and EU-27 imports

tonnes	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
China	36	40	62	376	3 061	7 231	20 599	49 400	65 000*

*estimate / Source: Eurostat

Grapefruit - Estimate of apparent consumption				
	Net supply (tonnes)	Consumption (kg/capita/year)	Population (million inhabitants)	GDP/PPS
EU-15	**314 141**	**0.8**	**396**	
Netherlands*	43 961	2.7	16	132
France	81 289	1.3	63	113
Belgium	11 068	1.0	11	123
Ireland	4 115	1.0	4	143
Germany	67 035	0.8	82	114
Scandinavia	16 500	0.7	25	134
Sweden	7 866	0.9	9	120
Denmark	4 941	0.9	5	127
Norway	1 476	0.3	5	187
Finland	2 217	0.4	5	116
United Kingdom	42 370	0.7	61	119
Austria	3 835	0.5	8	129
Italy	26 622	0.5	59	104
Spain**	15 000	0.3	45	102
Greece	1 253	0.1	11	97
Portugal	1 093	0.1	11	74
NMS	**106 651**	**1.0**	**102**	
Baltic States	11 602	1.7	7	60
Romania	33 762	1.5	22	38
Slovakia	5 096	1.0	5	64
Czech Rep.	10 154	1.0	10	79
Bulgaria	8 020	1.0	8	37
Poland	33 323	0.9	38	53
Hungary	4 260	0.4	10	65
Slovenia	434	0.2	2	89

*overestimated figures for the Netherlands (entry point) / **estimation / GDP: Gross Domestic Product / PPS: Purchasing Power Standard
Source: Eurostat

Mexico: Yucatán and Michoacán

Is Mexico, known as an inter-season supplier of the European market, gaining weight? After Yucatán, Michoacán, another production region, entered the European market in 2006, strengthening Mexican presence on the European market. The figures for the 2008 season confirm this: volumes of Mexican grapefruit exceeded 12 000 t for the first time, while Yucatán, suffering from drought, shipped only limited volumes.

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The sales period for fruits from this region is currently centred on its usual August-October period. However, the climate and altitude make it possible to run the production calendar from April to October, in contrast with that of the other main regions of Mexico. It could continue to expand. Available production is concentrated in the 'Nueva Italia', totals some 55 000 t and is continuing to grow. Is this a strategic position in case of a more marked shortfall in Florida?

What will be the size of the market to be shared?

Although there seems to be no lack of takers for greater market share, what will there to be shared in the coming years?

We have noted above that consumption is clearly decreasing in Japan and the United States. The good performance of the western European market is only apparent. The increase in volumes mentioned above is caused by shaddock, the volumes of grapefruit sold are decreasing. The economic downturn does not seem to be doing much to help: although the consumption level seems to be holding in France, an unprecedented 15% fall seems to have taken place in Germany, according to panel sources. Eastern Europe is the only market in the world of significant size that still displays growth.

The situation is thus alarming, especially as the monthly penetration rate (the percentage of households making a purchase during a one-month period) is particularly low. It is less than 20% in France, the EU's leading market! And the average consumer profile is nothing to rejoice about either. Using the example of the French market again, grapefruit is markedly under-consumed by persons under 50 (and especially those under 35) and over-consumed by the oldest section of the population, especially the over-65s.

What are the strategic lines to be used to re-launch demand and how can they be exploited?

How can consumption be restored? Varietal innovation is probably one of the best strategic approaches. The Israeli industry may hold a winning card, according to a recent article in the Haaretz: 'Aliza', a sweet grapefruit that is easy to peel, seedless and a characteristic orange colour both inside and outside is being developed at the Volcani Center. However, it is still too soon to make a judgement on the true potential of the variety as tests have not yet been completed.

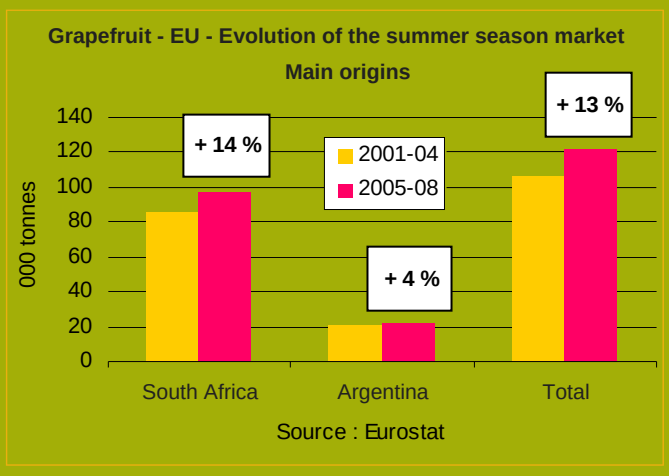
Another more obvious answer would be to resume promotion. However, times are not right for a single source to mobilise the large budgets necessary. Florida, by far the most active region in the promotion of grapefruit, is devoting its budgets to research on citrus greening (HLB). In addition, in contrast with oranges and easy peelers, no European budget has been allocated to grapefruit as it is little grown in the EU.

What can be done in this situation? Let's imagine. What if professionals upstream and downstream organised the re-launch of grapefruit themselves? This dream has

Summer season: slight EU market growth benefiting South Africa

Has the decrease in the volumes exported from Florida benefited stakeholders supplying the summer season? The reply varies according to the market. Although we have seen that the answer is very clearly 'no' in the case of Japan, European imports have increased slightly. The volumes delivered during the summer increased from about 100 000 -115 000 t before the problems in Florida to 110 000-130 000 t in recent seasons, that is to say an increase of about 10 000-15 000 t. The EU has thus confirmed its position as the world's leading market for southern hemisphere grapefruit, ahead of Japan. However, it should be emphasised that the enlargement of the EU to 25 member-countries in 2004 and then to 27 in 2007 doubtless contributed to this growth. The balance also reveals differences when the situation is analysed source by source. The increase has little benefited Argentina. Suffering from recurrent drought and the spread of citrus canker—detected in the province of Salta in 2002—Argentinian exporters have lost part of their export potential and have switched shipments more massively to eastern Europe and especially Russia. Likewise, and in contrast with the winter market, no secondary source has developed and no outsiders have appeared. Arrivals from Uruguay have remained marginal and Chile, that seemed to wish to increase shipments to the EU, is more and more discreet. Exports had approached 4 000 t in 2006 and totalled only 1 500 t in 2007 and 2008, being sent mainly to neighbouring countries including Argentina. Frost during the 2006 southern hemisphere winter probably accounts for the decrease, that might possibly continue for other reasons. Chilean production potential is only about 10 000 t and the opening of the United States market in May 2009 may well create a strong suction effect, even if customs tariffs will not be fully liberalised until 2012.

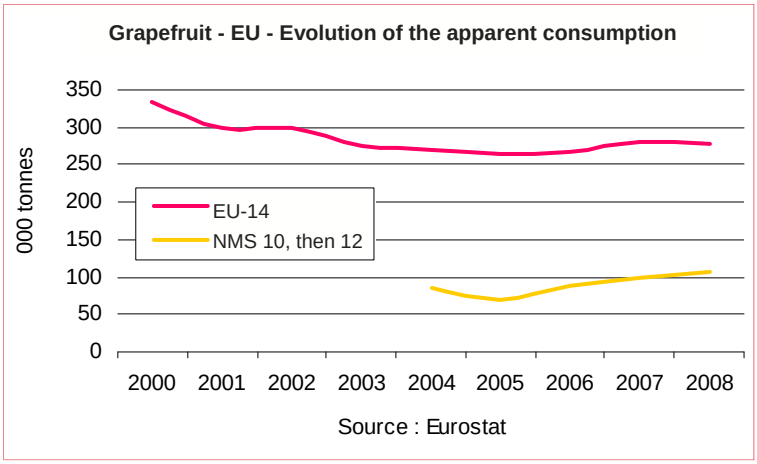
As a result, the source that gained most on the EU market was South Africa, the leading supplier, with an increase in imports of about 15% between before and after 2004. Another cause for satisfaction is that South African exporters have also managed to gain footholds on other large markets. Russia imported less



Grapefruit — Southern Hemisphere

Tonnes	1997	1998	1999	2000	2001
Austral Africa	68 097	110 423	87 897	108 231	76 752
Argentina	27 453	24 863	19 943	14 456	19 084
Uruguay	1 784	1 580	539	300	1 325
Chile	-	-	-	-	-
Total	**97 333**	**136 866**	**108 378**	**122 987**	**97 160**

Overestimated figure for Austral Africa in 2004 / Source: Eurostat - EU 15, EU 25 from 2004, EU 27



become reality for other produce. In the United States, the California avocado growers' organisation and those of Chilean and Mexican exporters combined to increase consumption three-fold. Closer to the EU, the Banana Group formed by the main banana marketers in the United Kingdom, succeeded in increasing consumption by more than 250 000 t over a period of about 15 years. The grapefruit sector has assets for success in the first essential stage in such an operation, that is to say that a critical mass of interested operators can be assembled. The export sector is fairly concentrated (Israel and Spain) and has representative organisations capable of managing this type of operation: the Plant Production and Marketing Board in Israel, AILIMPO in Spain, FDOC in Florida and the brand-new Citrus Board in Turkey. A budget can then be assembled by a levy of a few cents on each box sold. In fact, the example of avocado also gives good ideas for overcoming the reluctance of some supplier countries to form an alliance with competitors. Not all the budget is devoted to generic promotion; some is re-allocated for 'source' promotion operations.

Tried and tested solutions are readily available and it is a good thing to make a reminder that an alliance for promotion purposes in no way stops every company having its own marketing and sales policy ■

Eric Imbert, Cirad
eric.imbert@cirad.fr

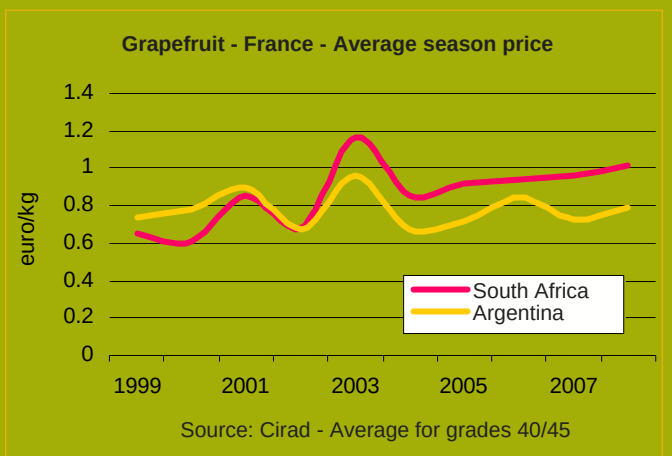
than 500 000 boxes in 2006 but took over a million in 2008. Furthermore, financial returns for growers have been comparatively satisfactory in recent seasons, as can be seen in the firming of the average season price at the import stage. As a result, the areas under grapefruit have increased noticeably. Planting was running at the rate of some 150 000 trees per year at the beginning of the decade and has exceeded 300 000 trees per year since 2004. The total area concerned was about 7 800 ha in 2004 and approached 8 500 ha in 2007. In recent seasons, production has oscillated between 350 000 and 400 000 t in comparison with approximately 300 000 t at the beginning of the decade.

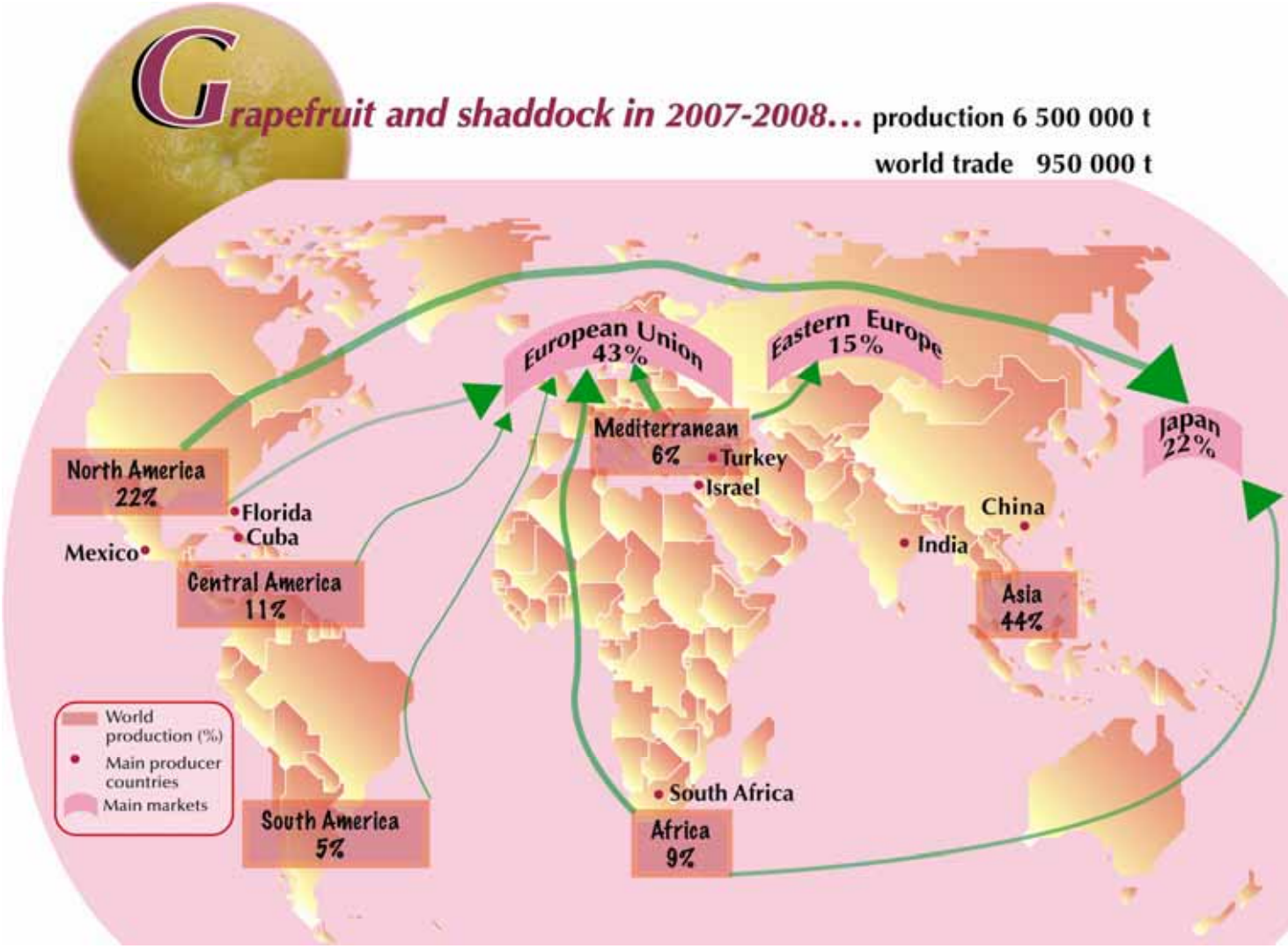
In addition, the export potential forecast by South African operators for the 2009 season is in the high average bracket: approximately 14 million 15-kg boxes. This is more than the 12.5 million in 2008 but fairly similar to the 2007 figure. So what will be available on the EU market this season? Allocations by destination will obviously be decisive in the current context of strong economic uncertainty and may be different from those of other seasons. South African exports to Russia are down at the beginning of the season but shipments to the very important Japanese market that has taken an average of 6 million boxes in recent seasons are at a fairly good level. The weakness of Argentinian production should result in smaller shipments to the EU than last year in spite of the practically total (and abnormal) concentration of shipments to Europe at the expense of the Russian market. The drought in the Salta region has had an extremely negative effect on fruit sizes and considerably reduced the quantities available for export. In fact, exports seem to have decreased since the beginning of June and this is very early. However, it should be underlined that although the Russian and Japanese markets are uncertain as regards receptiveness, this applies to the EU as well. Competition from the season's fruits with good crops after several meagre years, may add to the real or supposed effects of the economic downturn on fruit and vegetable consumption.

European imports

2002	2003	2004	2005	2006	2007	2008
96 653	85 355	84 062	110 288	82 482	105 286	93 868
18 882	24 504	19 583	26 869	17 627	23 513	17 078
483	665	401	576	2 063	775	298
-	-	200	474	2 513	959	719
116 018	**110 523**	**104 245**	**138 207**	**104 685**	**130 533**	**111 963**

7 from 2007 - code HS 08054000



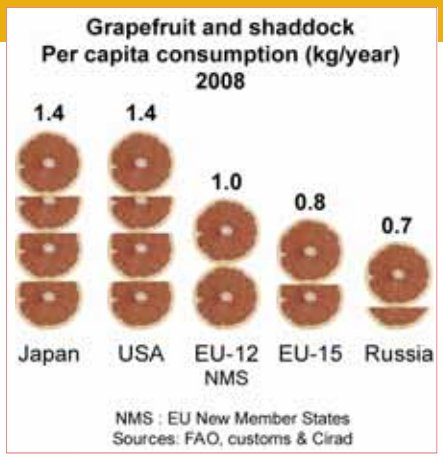


Grapefruit and shaddock — United States imports											
tonnes	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total, of which	**9 730**	**8 738**	**10 040**	**25 221**	**23 246**	**20 710**	**14 316**	**14 348**	**18 951**	**19 797**	**14 257**
Bahamas	9 422	8 224	9 749	23 821	23 016	20 459	12 676	13 812	16 216	14 420	10 362
Mexico	0	0	1	0	33	115	1 567	506	2 687	5 056	2 741
Others	7	73	119	1 259	0	56	17	3	5	101	1 050
Israel	301	441	171	142	197	79	56	27	43	220	104

Source: US customs, code 080540

Grapefruit and shaddock — Japanese imports											
tonnes	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total, of which	**229 905**	**262 416**	**272 278**	**268 650**	**284 687**	**274 328**	**288 510**	**205 961**	**170 881**	**212 883**	**184 279**
United States	194 038	206 975	216 652	202 286	219 457	194 262	202 663	93 335	109 341	138 777	126 097
South Africa	12 906	30 147	32 193	48 431	52 564	65 775	69 408	96 707	48 562	64 335	49 611
Israel	5 462	7 344	5 710	6 143	5 009	4 904	5 443	4 572	2 316	4 283	4 498
Swaziland	17 067	17 498	17 607	11 673	7 503	8 568	8 354	10 418	9 335	5 396	3 589
Cuba	-	430	38	75	19	609	1 381	151	671	-	-
Chile	0	0	0	41	134	188	1 173	757	599	-	-
Others	10	22	78	0	1	23	89	21	56	46	242

Source: Japanese customs, code 080540000



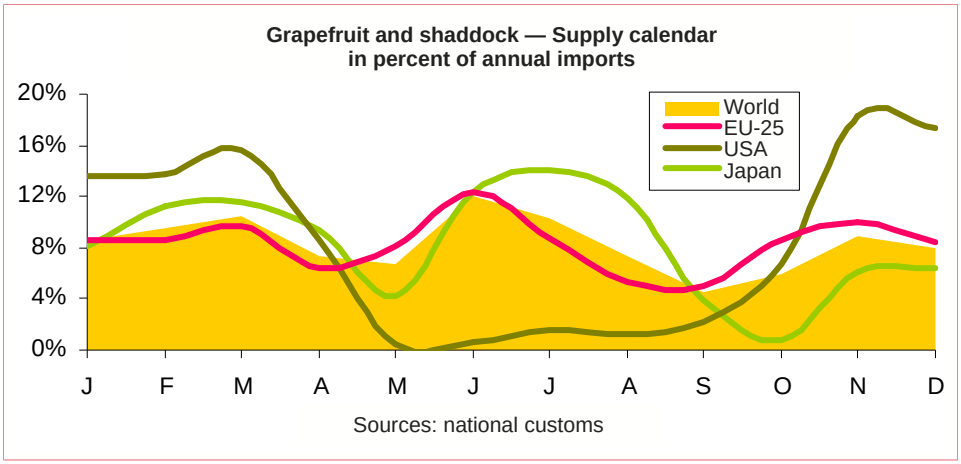
Grapefruit and shaddock World production	
2007-2008	tonnes
World	**6 449 700**
China	2 500 000
United States	1 423 000
South Africa	386 000
Mexico	324 000
Israel	235 000
Argentina	220 000
Turkey	200 000
India	178 000
Cuba	175 000
Brazil	72 000
Sudan	68 000
Belize	57 000
Iran	54 000
Spain	47 600
Jamaica	43 500

Grapefruit and shaddock World exports	
2007-2008	tonnes
World	**950 000**
United States	270 000
South Africa	186 000
Turkey	131 100
Israel	81 100
Spain	38 100
China	101 000
Cyprus	17 100
Argentina	29 000
Bahamas	15 000
Honduras	13 000
Swaziland	9 500
Mexico	13 000
Egypt	1 200
Thailand	9 400
Cuba	6 000

Grapefruit and shaddock World imports	
2007-2008	tonnes
World	**950 000**
EU-25	405 000
Japan	213 000
Russia	93 000
Canada	45 000
Romania	30 000
United States	19 800
Ukraine	12 000
Saudi Arabia	10 000
Switzerland	7 600
Bulgaria	6 600
Mexico	5 000
Singapore	4 000
South Africa	3 900
China	3 400
Serbia	3 100

Sources: FAO, national customs, USDA, CLAM, CGA

Sources: professional sources, FAO, EU customs, Japan, IFAS



Grapefruit and shaddock — European Union imports											
tonnes	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Total	**441 909**	**423 679**	**424 263**	**363 063**	**385 153**	**357 414**	**357 310**	**378 809**	**364 578**	**416 533**	**404 852**
Total N. hemisphere*	**304 523**	**315 241**	**301 498**	**265 710**	**269 065**	**246 627**	**273 634**	**240 518**	**259 807**	**286 967**	**294 456**
United States	144 570	133 521	110 896	108 330	109 033	101 119	114 010	53 077	42 911	66 275	77 089
Israel	88 136	83 708	77 837	54 474	43 369	42 878	44 536	62 612	54 453	60 849	60 898
China	12	17	24	36	40	62	376	3 061	7 231	22 253	45 342
Turkey	18 078	36 149	45 268	45 107	49 066	38 918	43 017	42 709	80 893	52 761	42 767
Spain	17 975	16 806	17 978	16 453	20 463	23 848	20 936	29 927	33 406	36 241	34 796
Cyprus	0	15 065	13 351	14 932	14 275	15 070	16 425	16 967	14 832	12 332	10 329
Mexico	1 429	2 351	2 845	1 715	5 929	3 939	5 728	7 594	4 527	9 834	9 304
Honduras	15 177	11 835	15 287	10 643	8 912	9 862	13 547	13 169	12 340	12 385	8 820
Others	4 562	6 459	4 505	5 099	6 703	5 204	5 237	7 987	8 514	8 603	5 111
Cuba	14 585	9 332	13 508	8 923	11 275	5 727	9 823	3 415	700	5 434	0
Total S. hemisphere	**137 386**	**108 437**	**122 765**	**97 353**	**116 088**	**110 787**	**83 676**	**138 291**	**104 771**	**129 566**	**110 397**
South Africa	90 776	72 788	92 183	64 330	84 392	76 658	55 833	97 170	72 924	90 825	82 386
Argentina	24 863	19 943	14 456	19 084	18 882	24 504	19 583	26 869	17 627	23 186	16 453
Swaziland	16 567	11 241	10 928	8 604	9 144	6 111	5 369	7 197	7 210	10 085	9 239
Zimbabwe	2 519	2 859	4 148	3 534	3 117	2 586	1 436	5 001	2 227	3 556	1 319
Chile	5	5	0	0	0	0	200	474	2 513	959	699
Uruguay	1 643	349	58	1 325	483	665	401	576	2 063	775	236
Others	451	244	21	193	70	175	75	85	87	180	65
Mozambique	561	1 009	972	283	0	88	780	919	120	0	0

*Extra-community imports and entries from the main European producer countries (Spain, Cyprus) / Source: Eurostat

Cultivation of grapefruit

The plant

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

Climatic requirements and effect of the environment

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

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

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

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

Cumulated heat in northern zones is not sufficient for the fruits to ripen fully before the winter. The production cycle may then last for 12 months or even more. The fruits must remain on the trees before completing their development in the following spring. They are exposed to rain and low temperatures and this can cause physiological damage to peel or internal damage in case of frost.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Grapefruit diseases	Tristeza **Virus: Citrus Tristeza Closterovirus**	Canker **Bacterium: *Xanthomonas axonopodis* pv. *citri***	Huanglongbing **(Greening)** **Phloem bacteria: Liberibacter africanum, L. asiaticum**
Symptoms	Decline of varieties budded on sour orange, paling of leaf veins, stem-pitting	Corky pustules on leaves, fruits and shoots	Yellowing shoots, leaf marbling, small poorly coloured fruits, decline
Part attacked	Young, growing organs (shoots, flowers)	Aerial parts: young organs, wounded organs	Aerial parts
Cause	Presence of infected plants in the field or nearby	Bacteria released from lesions, infection enhanced by mechanical or weather (hurricanes) wounds or the citrus leaf miner (*Phyllocnistis citrella*)	Presence of infected plants in the field or nearby
Transmission	Aphids: *Aphis gossypii* and *Toxoptera citricida*, budding	Via air and water	Psyllids: *Diaphorina citri* and *Tryoza erytreae*, budding
Measures to be taken	Control of vectors (chemical, biological control, etc.)	Application of products containing copper or Kasugamycin, removal of infected trees in case of light attack, watering at soil level	Control of vectors using chemical, biological methods, etc.
Prevention	Use of healthy plant material, cross-protection (measure subject to discussion)	Use of healthy plant material, tolerant varieties, protection of young organs	Use of healthy plant material
Economic impact	Loss of trees and decreased production, EU quarantine organism (control of movements)	Harvest loss by fruit fall, EU quarantine organism (control of movements)	Decline of trees, shorter orchard life, EU quarantine organism (control of movements)
Distribution	All regions except for certain countries in the Mediterranean area	Asia (including the Middle East), South America, Florida, small presence in Africa	Asia, tropical and subtropical Africa, the Middle East, Brazil, Florida

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


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

Varieties

Grapefruit and shaddock—frequently confused cousins. Grapefruit and shaddock are frequently confused in common or trade usage. But the two fruits have different characteristics as the grapefruit (*Citrus paradisi* Macfad.), pomelo in French, is not the same botanical species as the shaddock *(Citrus maxima)*. Shaddock, called pamplemousse in French and chadèque in the French West Indies, may be called Chinese grapefruit on European market. But it should not be called grapefruit and vice versa.

Fruit characteristics	Grapefruit	Shaddock
Size (diameter)	8 – 15 cm	10 – 30 cm
Weight	250 to 500 g	400 g to 2 kg
Shape	flattened to pear-shaped	flattened to pear-shaped
Peel	fine to medium thickness	thick to very thick
Central axis	open, little or medium-developed	open or closed, well developed
Seeds	few or none	from none to numerous
Pulp colour	pale, yellow, pink or strong red	pale yellow, pink or strong red
Pulp texture	juicy	firm or even crunchy
Bitterness	weak to strong	none to weak

Guangximi you

This variety originated in Fujian Province ('Guangxi' in Chinese), where it is still widely grown in the Pinghe region. It forms a large proportion of Chinese production. The fruit is medium-sized to large (from 1 to 2.5 kg) with a typical oboval shape. The yellow skin is of medium thickness (about 0.8 cm). The flesh is white and pale with some green lights, soft and medium to fairly juicy. The flavour is sweet and slightly acidulous. The fruits have excellent keeping qualities. The variety is usually sold commercially under the name 'Honey Pomelo'.

Marsh

'Marsh' was bred from a sowing of 'Duncan' seeds in about 1860 near Lakeland, Florida. The variety was the first to be practically seedless (two or three seeds per fruit) and it developed very strongly. 'Marsh' is still the most commonly planted cultivar and the most widespread in the world, even though a general trend towards coloured varieties is observed. Furthermore, it is extremely suitable for canning. Its taste qualities are satisfactory although acid and sugar contents are lower than those of 'Duncan'. However, a few problems are noted at the beginning (high acidity) and the very end of the season (loss of aroma). The fruits are medium-sized to small—not as large as 'Duncan'—and are pale yellow in colour. The skin is medium thick, regular and very smooth. The flesh is soft and very juicy.

Flame

A natural mutation of 'Ruby Red', 'Flame' was discovered by H.K. Wutsher in 1973. The fruits are attractive. They are spherical and larger than those of 'Star Ruby' and of a similar size to those of 'Ruby Red'. Suitability for keeping on the tree is good. The skin is particularly fine and smooth. The basic colour is a light bronze similar to that of 'Star Ruby', differing from the pale yellow of 'Ray Ruby' and 'Ruby Red'. Large areas pigmented with as intense a red as that of 'Ray Ruby' can be observed but this colouring is nevertheless not as marked as that of 'Star Ruby'. The flesh is a uniform red similar to that of 'Rio Red'. The fruit is juicy and firm. The variety is planted in significant quantities in Florida and Argentina. It is marginal elsewhere.

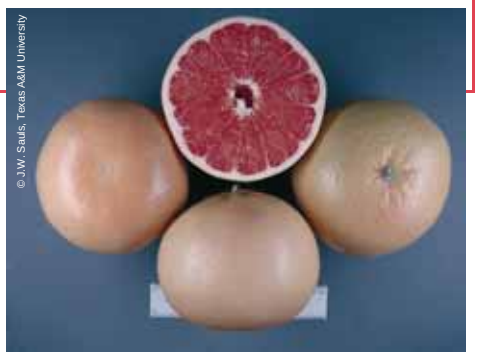
Ruby

(Redblush, Ruby Red, Henninger)

'Ruby', a bud mutation of 'Thompson', was discovered in Texas by A.E. Henninger in 1926. It differs from the parent by the stronger pigmentation of skin and flesh. Its other characteristics are very similar to those of 'Thompson'. However, the sugar and acid contents are sometimes slightly lower. 'Ruby' is still the most widely planted coloured variety in the world and forms a large proportion of new plantings in Florida. In contrast, it is losing momentum in Israel and South Africa.

Star Ruby

This recently developed variety (released in 1970) was obtained by irradiating 'Hudson' seeds. It has numerous good features. The flesh is the most strongly coloured of all the varieties currently grown. The skin is fine and smooth with strongly red faces. The fruits are practically completely seedless and finally the flesh is firm and juicy with high acid and sugar contents. The juice is intensely coloured. However, irradiation has reduced plant resistance to diseases and to excessive sunshine. Management is more delicate, especially because of its susceptibility to certain herbicides. Yields are generally smaller. The variety is therefore tending to lose ground in some countries to the benefit of hardier cultivars ('Rio Red' and 'Flame').



Coloured varieties

A marked switch to coloured varieties has been observed in consumer expectations in the last 20 to 25 years. The change is almost total in Europe. Even Japan, the world's leading market and traditionally a consumer of white grapefruit, has been affected by the change.

Grapefruit — Intensity of the pigmentation of the skin and flesh of various varieties
(after James Saunt in Citrus Varieties of the World, Sinclair Publishing)

Varieties	Skin	Flesh
Burgundy	-	★★★★
Thompson (Pink Marsh)	-	★
Ruby (Ruby Red, Redblush)	★★	★★
Henderson	★★★★	★★★
Ray Ruby	★★★★	★★★
Rio Red	★★★★	★★★★
Flame	★★★★	★★★★
Star Ruby	★★★★★	★★★★★

★ = weak ★★★★★ = very strong