

CLOSE-UP

Litchi

Kiwi from the southern hemisphere:
finding a second wind

Citrus and exotics:
monthly review

<http://passionfruit.cirad.fr>

A report prepared by
Pierre Gerbaud and
Christian Didier

Litchi

The profile of the 2010-11 litchi sales season confirms the trends observed in previous years. The development of sales from November to February with produce from countries in the Indian Ocean remains the high point of the year as practically all European imports are centred on this period. Other sources ship much smaller quantities that often decrease from one year to the next. Thus Thailand and Israel are less present in Europe. Mexico and China recently gained footholds in Europe but shipments are stagnating or increasing very slowly, with produce delivered during the summer, a season that is less favourable for litchi consumption. The major event in the recent season was doubtless the problem of the sulphur treatment of litchis from Madagascar as this could call into question the evolution of trade in this festive fruit

Contents

p. 16	Indian Ocean litchi in 2010-11: one of the worst seasons of the decade
p. 19	Litchi from Madagascar in 2010- 2011: between Scylla and Charybdis!
p. 23	The 2010-11 litchi season: other sources
p. 29	Sulphur treatment of litchis: Madagascar: a sulphurous sector
p. 30	World statistics panorama
p. 32	Litchi quality defects
p. 34	Cultivation of litchi
p. 38	Litchi varieties

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Indian Ocean litchi in 2010-11

One of the worst seasons of the decade



Weeks 47 to 49

Too late a start and weak market involvement

The Indian Ocean litchi marketing season started particularly late for the second year running. The reason was poorer weather conditions during fruit formation. Shortage of rainfall in the production zones in Madagascar in the last weeks before the harvest considerably slowed fruit growth. Late production resulted in late release on the market and the simultaneous arrival on the European market of fruit from the different Indian Ocean sources. As in preceding years, the selling prices of the first batches fell rapidly day after day because of the rapid increase of volumes on a market that was little involved. The prices fetched were low and close to, if not below, the profitability threshold.

Shipments from South Africa started in mid-November after good rainfall in the production zones.

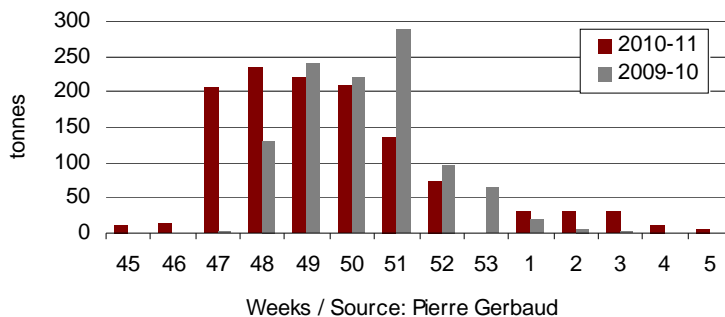
Week 50

The air/sea switch or shades of Genoa

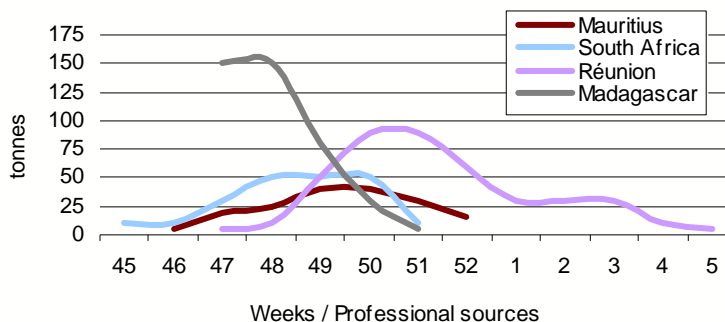
So as not to hold back fruits imported by air after the arrival of the first ship, operators reduced shipments from Madagascar. The first ship, the Hansa Stockholm, was expected in Zeebrugge on Friday 17 December, and this made them all the more inclined to reduce arrivals. As unloading was planned as soon as the ship docked, the first goods were to be available during the night and most of the tonnage sold from Monday 20 December. The massive sales of the weekend before Christmas were therefore compromised. Week 50 was one



Litchi by air - Weekly arrivals on the European market from all origins



**Litchi by air - 2010-11 season
Weekly arrivals on the European market**



photos © Guy Bréhiniér

of serious worries. The weather forecast was very poor, with bad road conditions in Europe, without allowing for the start of the school holidays, especially in France. One year afterwards, practically day for day, this late arrival of litchis from Madagascar was under the shadow of Genoa.

Week 51

Arrival of litchi by sea in a snowstorm

The Hansa Stockholm, the first ship to arrive from Madagascar, docked in the port of Zeebrugge in Belgium at about 10 p.m. on Friday 17 December. It was unloaded immediately so that the produce could be delivered as soon as possible. However, the late date of arrival of the ship and the difficult unloading operations resulting from haste to sell the goods and abominable weather conditions slowed the release of the fruits on the market.

The only glimmer of optimism in this dark picture was the good overall quality of the fruits. It is true that most were small, but they were well-coloured and tasted pleasant.

Almost all the cargo of this first ship had been sold when the second conventional ship arrived from Madagascar. It docked at Vlissingen, Netherlands, during the night of 21 to 22 December. Unloading started very early on 22 December and was completed in the evening of the next day. Further snowfall also disturbed the delivery of the cargo of the second ship to the different European markets. The quality of the litchis from the Hansa Visby was identical to that of the fruits carried by the first ship.

The late arrival of the first ship and the close reception of the second complicated sales of litchi from Madagascar. The first cargo could not benefit from sales during the weekend preceding Christmas and sales of the second were carried over until after Christmas, when demand traditionally dwindles.

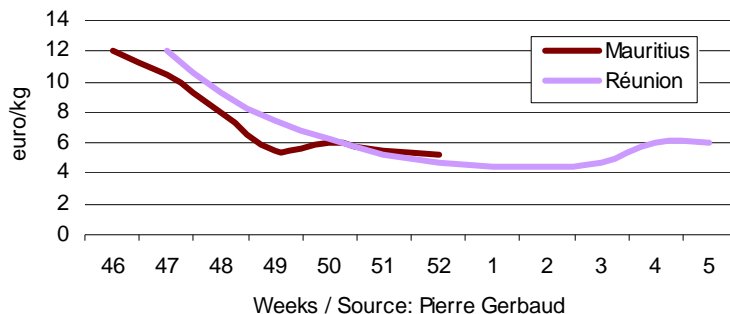
Week 52

German market dip

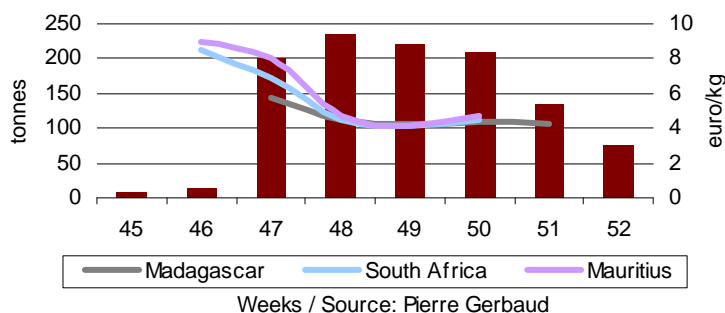
The major German retail distributors decided to suspend sales of litchis after analy-



Fresh litchi on the branch by air - 2010-11 season
Average import price on the French market



Sulphur treated litchi by air - 2010-11 season
Volumes and average import price on the French market



sis of residual sulphur in litchis from Madagascar revealed many cases of levels higher than the authorised MRL (maximum residue limit).

This halting of sales called the performance of the season into question as the German market takes 30 to 40% of Madagascar shipments by sea. The closing of the German market diverted the tonnage that would normally have been sold in Germany to other European markets. This caused market overloading that affected prices.

January 2011 Stagnation

Large stocks were still available and weighed on transactions, especially as fruit quality displayed deterioration. The late start to sales of the fruits and the closing of the German market carried volumes over into a period that was much less favourable for sales of litchis.

The large quantities of fruits carried by the second ship and still available ran up against the first litchis that had arrived in containers. However, low prices made it possible to sell large volumes but the rate of release was still too low.

Demand woke up slightly in Week 3 on some markets, such as France, for the Chinese New Year. Prices stabilised or even firmed a little.

The increase in arrivals of larger fruits from South Africa attracted a number of consumers. However, litchi started to disappear from most European markets.

February 2011 A long and difficult end of the season

The stocks available were sold at open prices to clear them and reduce losses in relation to cost price, but the produce moved slowly.

Week 7 marked the end of sales of Indian Ocean litchis. No change in trend was observed at the end of the season ■

Pierre Gerbaud, Consultant
pierregerbaud@hotmail.com

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Litchi from Madagascar in 2010-2011

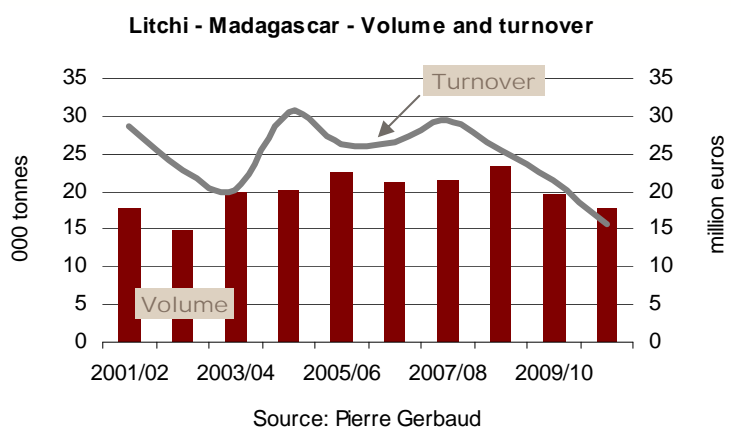
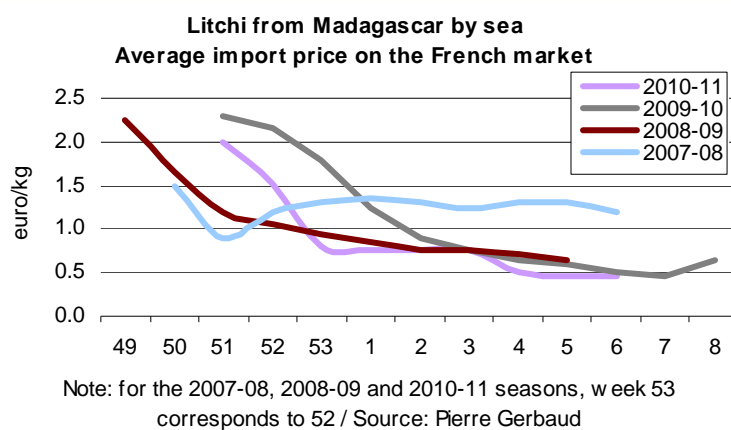
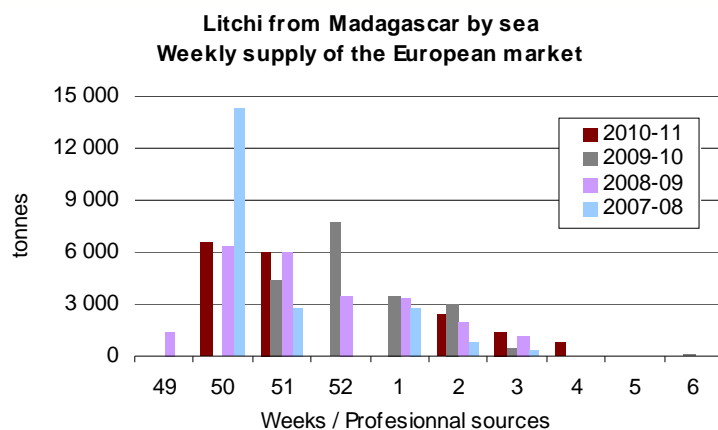
Between Scylla and Charybdis!



Everything had got off to a good start! Litchi sector stakeholders allowed for the pattern of the previous season and agreed to reduce the volumes shipped both in conventional ships to cover Christmas demand and by sea containers for the subsequent phase of sales. This approach aimed at better sales of litchis from Madagascar could only receive approval from operators and retail distributors after the 2009-10 season with two distinct phases. However, while Lady Luck may sometimes bring success to human endeavour, she certainly did not pay attention to Malagasy litchis this year, with its season behaving like a sailing ship fighting headwinds and scraping every rock on its route.

A condensed air shipment season

Indian Ocean litchi production was late, or even very late, for the second year running. This factor is of prime importance as it governs the logistics to be set up to supply the European market and the length of the sales period for fruits for the Christmas period. All the sources in the region were late to varying degrees and this resulted in a late, simultaneous start to the air shipment seasons. Although a few batches reached the market in Week 45, the quantities involved were only marginal. All sources shipped larger volumes in Week 47. The sudden influx of produce on a little-prepared market sent prices into a downward spiral with the situation worsening from one day to the next.



Prices were still around EUR 5.00 per kg at the beginning of Week 48 but a price war broke out between operators as they attempted to shift the produce received. This caused a fall in prices to some EUR 4.00 per kg and even less at the end of the week. With a higher cost price, fruits from Madagascar suffered from the greater competitiveness of South African produce. Sluggish demand at the beginning of the season aggravated the poor sales in a context of appalling weather with heavy snowfall paralysing logistics and doing nothing to encourage consumers to buy litchis.

Week 49 started with the same market conditions with prices not exceeding EUR 4 per kg. The situation improved a little in the second half of the week as a result of smaller deliveries from Madagascar and greater involvement of supermarkets that stimulated demand.

Week 50 was the period for the switch from air freight to sea freight. The fresh decrease in arrivals from Madagascar and brisker demand allowed a comparative recovery of prices to around EUR 4.30 per kg. Operators' fears of holding stocks of air litchis when the first fruits shipped by sea reached the market, resulting in selling at a loss, encouraged them to reduce the volumes ordered from suppliers. In parallel, distributors increased their supplies to use publicity to benefit in subsequent weeks from the impact of the strong reduction in their retail prices. Paradoxically, the late arrival of the first ship from Madagascar resulted in a short period of under-supply at the end of Week 50 and prices recovered from EUR 4.00 to 4.80 per kg, making the end of the air season better but unfortunately only for limited quantities.

Overall, about 415 tonnes of litchis was exported during the Malagasy air freight season. This was fairly similar to the 400 t shipped during the preceding season.

A nightmare sea freight season

Although the weather conditions that caused a late litchi harvest made the sale of fruits carried by air more difficult, it

mainly disrupted the organisation of the sea freight season. Indeed, the lack of rainfall during the weeks and months preceding the harvest not only delayed the setting of the official date for the start of the season, as had happened the preceding year, but it also resulted in the production of mainly small fruits. This criterion is often considered to be secondary but not for consumers as there has been repeated criticism of Malagasy litchis for a number of years. But you can't govern nature ...

The start of the litchi harvest was set for 26 November, leaving little time to ensure supply for Christmas. Given the time required to load the ships, the sailing time to Europe and the time for delivery to the final recipient, the calendar seemed more than tight. Loading proceeded under good conditions and as quickly as in preceding years. It was more the logistic and commercial conditions that gradually transformed the Malagasy litchi season into a nightmare for the sector.

The dangers for shipping near the Horn of Africa and in the Gulf of Aden—an unavoidable passage to reach the Suez Canal—has resulted in shipping companies insisting on escorts as protection against pirates. These measures involve re-routing and extra stopovers and increase journey times. Thus it was decided to route the ships around the Cape of Good Hope as the loss of time is about the same. Then there was the question of the port of destination. As in 2009, this question was not settled until the ships had sailed. Traditionally, a Mediterranean port is chosen as the voyage is shorter and subsequent distribution to the European markets is good. As this time the ships came via the Atlantic, this choice was not necessarily the fastest solution and it was abandoned as no port could provide satisfactory unloading conditions during the pre-Christmas period. The ships were therefore rerouted to northern European ports.

The first vessel docked at Zeebrugge (Belgium) on Friday 18 December 2010. It arrived late in the evening and was unloaded non-stop until Saturday evening. This late arrival seriously compromised the possibilities of delivery for weekend sales. The season thus started very badly as it was impossible to profit from a generally key period of sales as regards the quantities sold then and the usually satisfactory selling prices. And as if fate



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wanted the strategy initially envisaged to be entirely torpedoed, snow fell heavily while the ship was being unloaded, making rapid delivery impossible as the road system was strongly affected and some sections closed to lorries. As a result, the first sales were made only on Monday morning at the earliest at the closest places to the port of arrival. Although sales were concluded on the basis of EUR 2.00 per kg during the first week of the season, they lost the sales potential of the week-end before Christmas. Logically, the price of litchis from Madagascar fell in Week 52.



cember. This ship also arrived late and the sale of its cargo was delayed until after Christmas when demand gradually dwindles. The only possibility was that of reallocating the fruits initially destined for Germany to other markets. The effects were obvious. Loading the other European markets with additional volumes caused an irremediable fall in prices. Operators first tried proposing fruits at a lower price, hoping to stimulate demand. The price fell to EUR 1.25 per kg in Week 52 but soon fell below EUR 1 per kg and then continued to sink until the end of the season.

Sales of litchis ran up against a series of obstacles: late production, late ship and logistics made complex by bad weather. But the coup de grâce came the following week, calling into question not only the financial results of the season but also its sustainability. The largest German retail distributors performed analysis of residual sulphur in litchis. The results exceeded the MRL and sales of the produce were suspended. In just a few days, about 30% of the exports from Madagascar earmarked for the German market lacked a consignee while the second ship chartered, with the same capacity as the first, was unloaded at Vlissingen-Flushing on 22 and 23 De-

As a result, a large proportion of the cargo of the second ship was still available at the beginning of the year when litchis in containers on line ships were soon due to arrive. The cumulation of the fruits brought in the second ship and those that arrived in January overloaded the market, leading to asphyxia. The pressure of the large quantities and the gradual worsening of fruit quality wiped out any hope of recovery. There was no longer a price for litchis from Madagascar at the end of the season. The sole aim of those with stocks of fruits was to shift as much as possible at the price their customers would agree to pay.

Finally, the 17 700 tonnes (415 tonnes by air, 12 600 tonnes in conventional ships and 4 700 tonnes in containers) exported this season from Madagascar were sold with difficulty on the European markets. The many factors that hindered the smooth running of the season and especially the closing of the German market totally masked the efforts made by exporters, who had agreed to a considerable decrease in tonnages in order to obtain better prices. For two of three years, the European market has displayed a tendency for the concentration of consumption within an increasingly limited period at Christmas. The measures taken by exporters seem to match this evolution. Perhaps it is necessary to go further along this line and also to go into aspects related to fruit quality ■

Pierre Gerbaud, Consultant
pierregerbaud@hotmail.com



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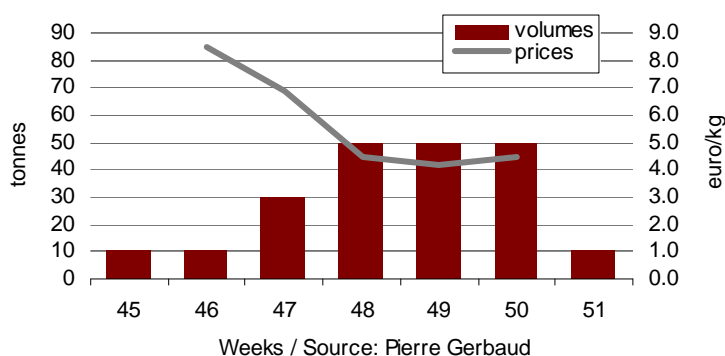


The 2010-11 litchi season

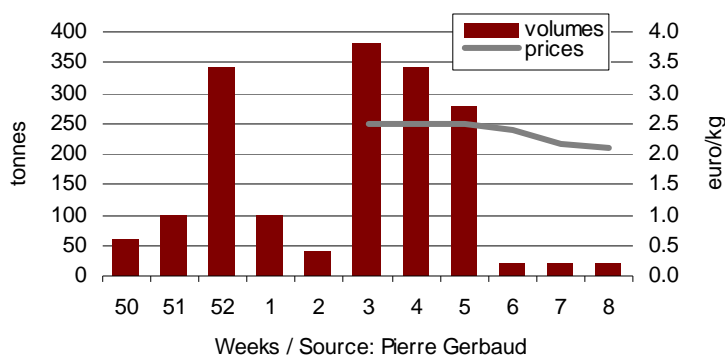
Other sources



Litchi by air - South Africa - 2010-11 season
Volumes and average import price on the French market



Litchi by sea - South Africa - 2010-11 season
Volumes and average import price on the French market



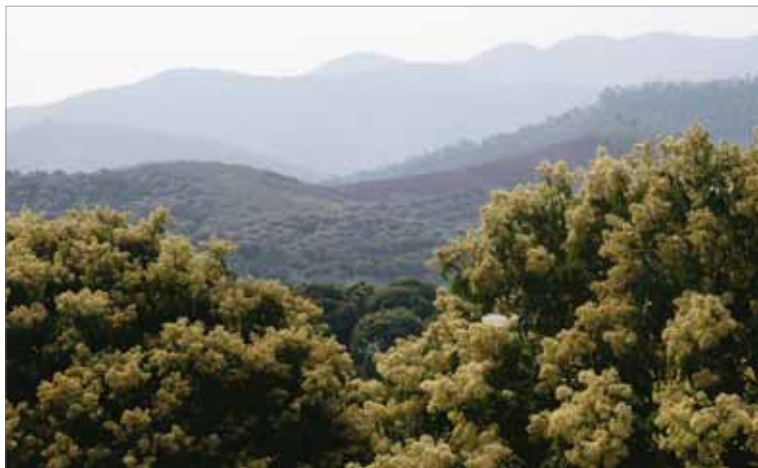
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South Africa

A game of cat and mouse

South African litchi exports decreased slightly in 2010-11 at 2 662 tonnes in comparison with about 3 000 tonnes in 2009-10. Slightly more than 1 700 tonnes was shipped by sea and 955 tonnes by air. This performance contrasts with that of the previous year when the total exported by air was much smaller at 300 to 400 tonnes. This distribution of exports is a clear illustration of adaptation to market conditions in Europe, in particular to avoid head-on confrontation with litchis from Madagascar sold at lower prices.

Shipments by air started in Week 44 with a rapid increase in volumes to benefit from a market where litchi was not yet available. The later start of fruits from the other Indian Ocean sources made it easier to sell these first shipments. Shipped mainly to northern European markets, litchis from South Africa reached France in Week 46, that is to say a week after the arrival of the first fruits from Mauritius and a week before those from Madagascar. But the season only began in earnest in Week 47 as the volumes had been fairly insignificant. The lateness of the litchi harvest in the Indian Ocean zone, as in 2009, resulted in the simultaneous start of exports from most sources. The cumulated arrivals brought prices down on a market with timid demand. The prices of litchis from the various sources became matched in Week 48 at half of those seen at the beginning of the season. They then stabilised as demand increased before Christmas, while supply increased. As in preceding years, shipments by air ceased when the first fruits arrived by sea.



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Exports from South Africa by sea also reached the European market, with an effort always made to avoid head-on competition with produce from Madagascar. A few containers reached Europe just before and then just after large deliveries from Madagascar. This game of hide-and-seek made it possible to keep prices higher than those of Malagasy fruits. It is true that South African litchis are a better size, available in smaller quantities and do not occupy precisely the same trade niches as those from Madagascar. However, their selling price is governed to a great extent by the scale of arrivals from the latter source. Larger fruit size is very good for the image of the South African fruits, especially after Christmas and the New Year when demand is less dynamic and more fussy. South African exporters have better mastery of sulphur treatment and this was also in favour of the source during the Malagasy litchi crisis on the German market. Exports by sea continued but exports by air were resumed with intensity to make up for the shortage of fruits on this market closed to fruits from Madagascar. This accounts for the unusual high figure of 1 000 t that was shipped in this way. Without replacing Malagasy supply on the German market, deliveries from South Africa by air were

rushed into the vacuum. These fruits shipped late by air were also found on the Dutch market in January, selling at EUR 4.00 to 4.50 per kg.

In spite of the downward price trend observed at the beginning of the year, South African litchis sold at distinctly higher prices than those of competitors. The absence of any problem of residual sulphur in the produce increased its reliability at the expense of deliveries from Madagascar whose prices were now plunging. The downside of South African strategy was doubtless the greater fragility of the fruits, with rapid deterioration of quality, making it necessary for consignees to sort the batches and clear stocks at low prices from time to time. Management of quality problems in South African fruits was certainly a sensitive point throughout the season as sorting rejects affected the financial results. However, as selling prices were higher, a balance was probably reached to judge by the continuity of shipments.

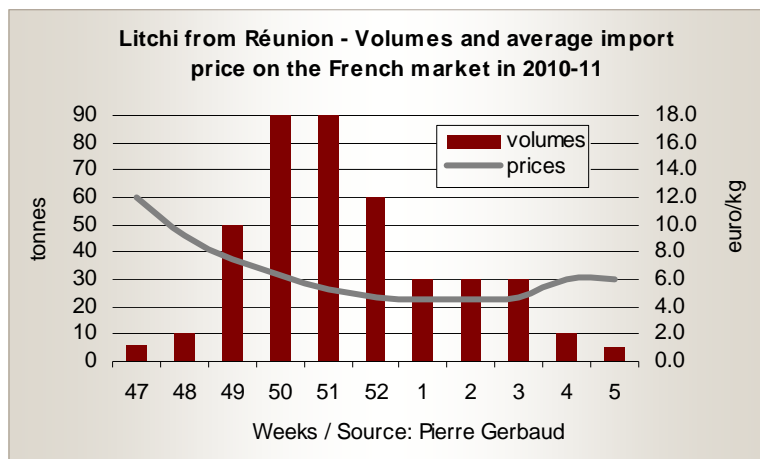
It was South African litchis once again that profited most from the Chinese New Year festivities as their quality in terms of fruit size and taste better matched this special demand. Although there were great differences between the profiles of the South African and Malagasy seasons, if only as regards the quantity of fruits shipped, the good price obtained for South African fruits is an obvious feature. The setting up of a grading scale, even if this does not correspond to any international standard, is an undeniable advantage for sales. It could usefully be applied by other sources in order to improve the quality of the fruits available to European consumers.

Réunion

Towards the democratisation of litchis?

The island of Réunion broke its litchi export record this season. Between 250 and 300 tonnes is generally shipped but this year the total exceeded 400 tonnes. The corollary of this increase in quantity was a marked decrease in selling prices during practically the whole season. It remains to be known whether the increase in volumes against average prices gave a positive result for professionals.

The Réunion export season started in mid-November, as in preceding years. The first fruits sold at high prices but these then fell con-



Spain, for reference

As in previous years, Spain, with litchi production in the south, is the only European country to supply a top of the range market segment during a gap in the supply calendar. In contrast with mango, where Spain has gained a strong position on the European market, litchi is still a minor complement to the range of Spanish subtropical fruits. The some 15 to 20 tonnes shipped was sold to fruiterers specialising in exotic produce. Sold at EUR 9.00 to 10.00 per kg, the fruits were found on several European markets (France, Belgium and the Netherlands) for a very limited fringe of consumers. The appearance of the fruits was good in 2010, with colour being probably the best asset. Mention should also be made of the satisfactory, more regular taste quality than in preceding years.



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tinuously during the first three weeks of the season, whereas volumes remained modest. Like the other sources, Réunion suffered from lack of enthusiasm at the beginning of the season caused by high retail prices and also the festive aspect of this fruit. Shoppers seem to wait and make their purchases for the Christmas festivities. Thus the fact that litchis are available a month before Christmas does not seem to encourage buyers, except for those shopping at specialised retailers.

In 2009, the same trend at the beginning of the season was followed by a stabilisation of prices in the run-up to Christmas and supply became more ample, a clear demonstration of the concentration of purchases during a very short period. Prices then increased as the quantities received decreased, especially as total volumes were smaller than in previous years. The profile of the Réunion season was distinctly different in 2010-11 as prices did not recover until the very end of the season when exports were becoming marginal. In contrast, the season continued after the traditional mid-January limit. The decrease in selling prices was directly related to the increase in volumes, even during the Christmas period, with supply exceeding demand. The poor sales of these additional quantities resulted in the rapid deterioration of the quality of the produce and they had to be sold to clear at lowered prices. The appearance of the fruits seems to have been commercially more important this year. Picked-off fruits generally fetched the lowest prices while those in bunches sold steadily at higher prices. This trend had not been as distinct in preceding years.

Calculation of the profitability of exports from Réunion remains the key to the evolution of this sector. Given the cost price delivered to destination markets, can his source encourage a certain democratisation of the fruit or must it conserve its high quality trade position? Is the search for signs of quality such as the 'Label Rouge' obtained a few years ago in contradiction with the market segment that Réunion litchis have occupied until now? Or are we seeing commercial diversification with a market in two parts?

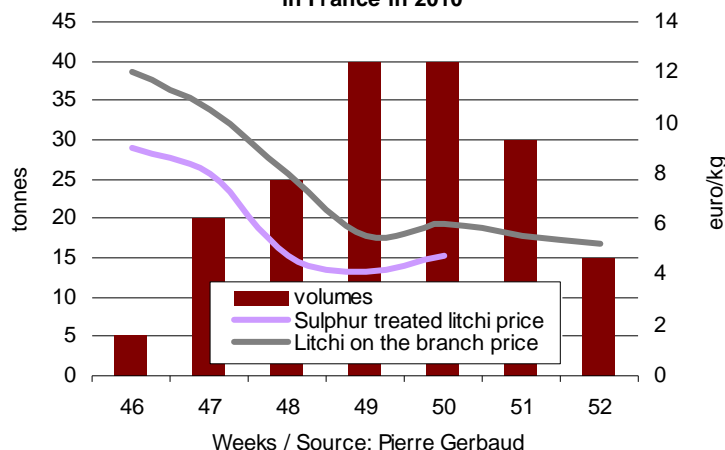
Mauritius

Early litchis ran late

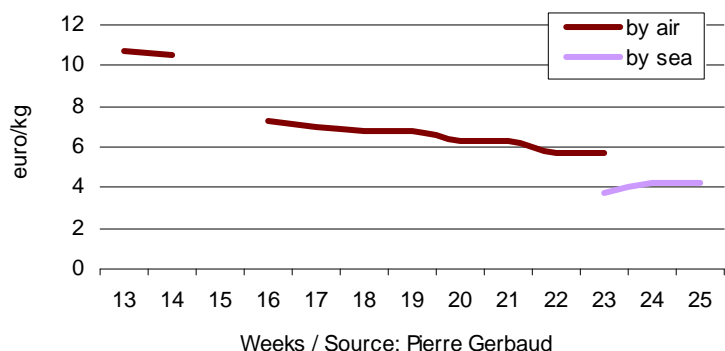
Mauritius is maintaining its position in the international litchi trade with 2010 exports estimated to be around 180 tonnes. More fruits were ex-



Litchi from Mauritius - Volumes and average import price in France in 2010



Litchi from Thailand - Average import price on the Dutch market in 2010



ported in 2010 than in 2009 when 120 to 150 tonnes had been shipped. Once again, the late 2010 harvest strongly compromised the shipping of early fruits that Mauritius has made a speciality in recent seasons. The season lacked the first one to two weeks during which Mauritius traditionally markets its produce with no real competition and thus benefits from the high prices fetched by the first batches shipped. But late production is certainly not the only explanation. Early litchis are doubtless an advantage for this source but quality is often lacking. The fruits are still too acid to please European customers, especially as the price is usually particularly high. A search for better taste quality was probably another reason for the late start of shipping.

The first shipments thus consisted of small quantities in Week 46 instead of in Week 44, as had been the case before the 2009 season. They then increased rapidly, peaking in Weeks 49 and 50 and dwindling in the last two weeks of the year. Selling prices started to fall in the second week of the season as they were under pressure from the overall volumes available on the market and competing sources were also increasing their shipments while demand increased at a slower rate. Mauritian exporters favoured the shipment of litchis on the branch at the beginning of the season. They then shipped sulphur-treated fruits to target a broader public but continued to supply fruits on the branch. Mauritian exports of sulphur-treated litchis ceased after the arrival of the first ship from Madagascar, and shipments then consisted only of decreasing quantities of fruits until the end of the year.

In spite of the concentration of exports necessary partly because of climatic conditions and partly because of competition from the other sources in the region, Mauritius is holding its position in the sale of litchis for the European market. A secondary source, it has succeeded in surviving among the large producer countries thanks to the improvement of the quality of the fruits produced and the adjustment of shipments to European market conditions. The concentration of exports in the hands of a limited number of exporters also helps in the mastery of flows, thus helping it to stand up against its giant neighbour.

Thailand

Minimum service

Would Thailand be following the trend in litchis observed for several sources that consisted in

China and Mexico: a supply complement

Mexico and China should be mentioned as secondary sources shipping litchis to the European market. Mexico ships small amount every year with more or less success. There do not seem to have been any significant shipments by air in 2010. However, fruits shipped by sea arrived between the beginning of June and mid-July. They were sold mainly in Belgium, France and the Netherlands. These were sulphur-treated fruits and sold steadily at EUR 2.50 to 3.00 per kg, with prices dipping at the end of the season.

China had hardly been seen in traditional tropical fruit channels in previous years but seemed more present in 2010. Export shipments went mainly to northern European countries from mid-July to the end of August. This source replaced Thai produce when shipments were suspended in June and covered the summer months, with fruits selling at EUR 2.50 to 3.25 per kg from the beginning of the season until mid-August. Prices then fell to EUR 1.50-2.25 per kg until the end of the season. Although China is the world's largest litchi producer, exports to European markets are small because of the distance and above all because of the strong domestic consumption of this sought-after fruit.



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a kind of refocusing of shipments on the European market? With an estimated 1000 tonnes shipped during the 2010 season, Thailand has strongly reduced its presence on the European market in terms of both quantities and sales periods. The political disturbances in Bangkok in May doubtless interfered with the progress of shipments to Europe. However, they do not explain the scale of the decrease in volumes for the season as a whole. Indeed, Thai exports had approached 2000 tonnes in preceding seasons.

The first shipments in 2010 were at the end of March, slightly later than in 2009, a particularly early year. Thailand had no competitors whatsoever as the season for Indian Ocean produce came to a rapid end. As in preceding years, most of the Thai produce was shipped to the Dutch market and then forwarded to the other European countries. The first batches were sold at high prices and it was difficult to find takers. Shipments were then suspended after two weeks because of heavy rainfall in the production zones. Postharvest operations were more difficult because the fruits were moist and it was not possible to meet the quality requirements of the destination markets at the prices asked.

Shipments were resumed in the second half of April. Increased supply volume and sluggish demand brought prices down but they were still fairly high. They weakened again in mid-May and the trend continued in the first half of June. This fall in the prices of Thai litchis shipped by air also coincided with the arrival of fruits shipped by sea and logically proposed at lower prices. The length of the sea litchi season was limited as it finished at the end of June when the first batches from Israel reached the market.

In contrast with preceding years, Thai exports stopped definitively at this time, whereas traditionally they continue until the end of August, running in parallel with the Israeli season. This shortening of the season by two months contributed significantly to the decrease in total shipments from this source. It also eliminated the most difficult sales period, August, when end of season Thai fruits generally sell at fairly low prices because of the worsening quality and because they are in competition with litchis from Israel. The pattern of Thai exports should be observed in the future to confirm or not a basic trend that seems to have been taking shape for two or three years, that is to say a gradual decline of litchis from this source on the European markets.

Narrower diversity of the produce shipped was also observed. Thailand has shipped 'Mauritius'

fruits for several seasons, but also shipped the large fruit variety 'Emperor'. It seems that this was less the case in 2010. However, air shipments of limited quantities of untreated, picked off fruits were also noted. This was doubtless evidence of shippers' desire to diversify their high-quality range. These are more natural fruits that better match current consumption trends.

Israel

Further decrease

The quantities shipped from Israel decreased distinctly for the second year running. What could have been considered as a temporary dip that is always possible for this kind of produce, seems to be a more deep-seated trend. Israel shipped an annual 800 to 1 000 tonnes of litchis to the European market during the first five years of the century. In 2006, a year marked with the war with southern Lebanon, shipments fell to about 600 tonnes. They held at this level until 2008 (630 tonnes) but then decreased again in 2009 (450 tonnes). The movement was confirmed in 2010 with exports estimated at around 310 tonnes. It is true that very hot summer weather did not favour production but this does not account for a decrease that is spread over a number of years. Are consumer markets losing interest? Is production turning to more traditional crops? It is difficult to be accurate on this point for 'summer' litchi whose foothold is small and uncertain on the European market.

The Israeli sales season was early in 2010, with the first batches arriving in mid-June rather than at the beginning of July. The early stopping of the Thai season in mid-June might

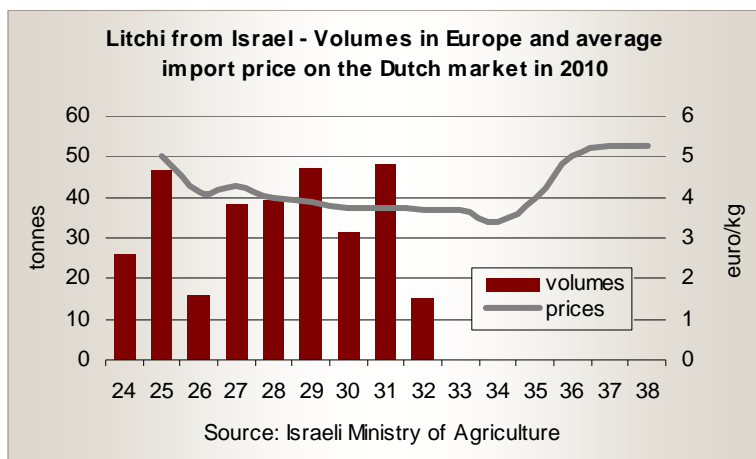


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have been involved, encouraging the rapid shipment of the first batches in order to profit from good sales conditions. Given the limited arrivals and the absence of competition, Israeli fruits sold steadily during the season. Prices weakened from mid-July to mid-August when deliveries peaked and demand was at its lowest because of the summer holidays, a period that is generally less favourable for exotic fruits. The early start of the season led to a rapid end. Deliveries ceased in mid-August. Sales were then of stored fruits. The small quantities available allowed a marked and rapid rise in the prices of good quality fruits. Those of poorer quality changed hands at distinctly lower prices.

Israel is still a key source of litchis for the European market in the summer but it has lost strength in recent years. The decrease is now substantial and contrasts with the measures taken in previous years and especially as regards varietal diversification. Israel was active in research on varieties and succeeded in selling varieties with a sweeter taste or that were seedless or nearly so. The broadening of the range of fruits satisfied various categories of consumer, even if the quantities of new produce remained marginal. Less use seems to have been made of this market segmentation in 2010 ■

Pierre Gerbaud, Consultant
pierregerbaud@hotmail.com





Sulphur treatment of litchis

Madagascar: a sulphurous sector

Yes, that does look like a rather easy sub-heading! But it does indicate the shadows that darken the Malagasy litchi sector. This is nothing new as it dates back to the early 1990s when authorisation was given to fumigate litchis with sulphur for longer keeping, with residual levels of 250 mg in the shell and 10 mg in the pulp. Sulphur treatment of litchis has always been a two-edged weapon, with on the one hand the possibility of using sea freight and increasing export volumes but on the other the residue regulation to be respected. Stakeholders in Madagascar were quick to develop quantities thanks to sulphur treatment but although the regulation aspect was not ignored, it was not considered with the same urgency. The respect of maximum residue limits is the Achilles heel of the litchi sector. However, setting up sulphur treatments procedures was a major preoccupation of support organisations for exporters in the 1990s. Full scale trials and successive improvements made it possible to limit residual sulphur levels but without fully guaranteeing that they are kept below the maximums authorised. Thus, official services detected levels that were too high every year, resulting in observations and fines for the first sellers, importers.

The old problem came back again with the crisis in the recent season but it was acute, making it more worrying than in previous years. Reconsidering treatment methods and setting up guarantees of the respect of MRLs are becoming essential for the future or the sustainability of the Malagasy litchi sector will be compromised. German distributors did not take lightly the decision to suspend the sale of Malagasy litchis. It seems that there had already been warnings but the absence of any trade sanctions had reduced the warnings to a virtual status. The position of retail distributors is in line with the general trend in the sale of foodstuffs for humans with stress laid on the safety of products in order to protect the health of consumers. There is not much to object to about the principle and it should be respected. What would have happened to Malagasy litchis if other European

retailers had followed their German counterparts? The question remains for the seasons to come. What should be thought of the reaction during the season of some people who wondered why litchis from Madagascar were still sold on the other European markets? Might German consumers be more sensitive to over the limit residual sulphur levels than the other Europeans? There is no need to demonstrate the seriousness of the situation.

Whatever it costs, Malagasy operators must take the measures necessary first to ship fruits that respect European regulations and second to provide appropriate information to the downstream part of the sector and to retail distributors in particular. The latter task will doubtless be complex but it is essential for returning to calmer sales of litchis.

Although this commercial crisis is serious, it has the advantage of stimulating reflection on the development of the litchi sector in recent years. The race for volume that was a dominant feature until recently has faded as prices have fallen year after year. Market evolution is probably moving towards smaller capacity if prices are to remain profitable. Reducing volumes is an important feature that is closely related to another factor of capital importance: the quality of the produce. Actions have also been limited here. In addition to the problem of sulphur treatment that requires complex technical skills, the fruit size aspect should be improved, at least during certain parts of the season. Concentration on better quality litchis will probably lead to a natural reduction of quantities as the operation requires more time. Thus the respect of MRLs and improved quality could be a way to better regulate the export capacity of Madagascar and the trade capacity of European markets ■

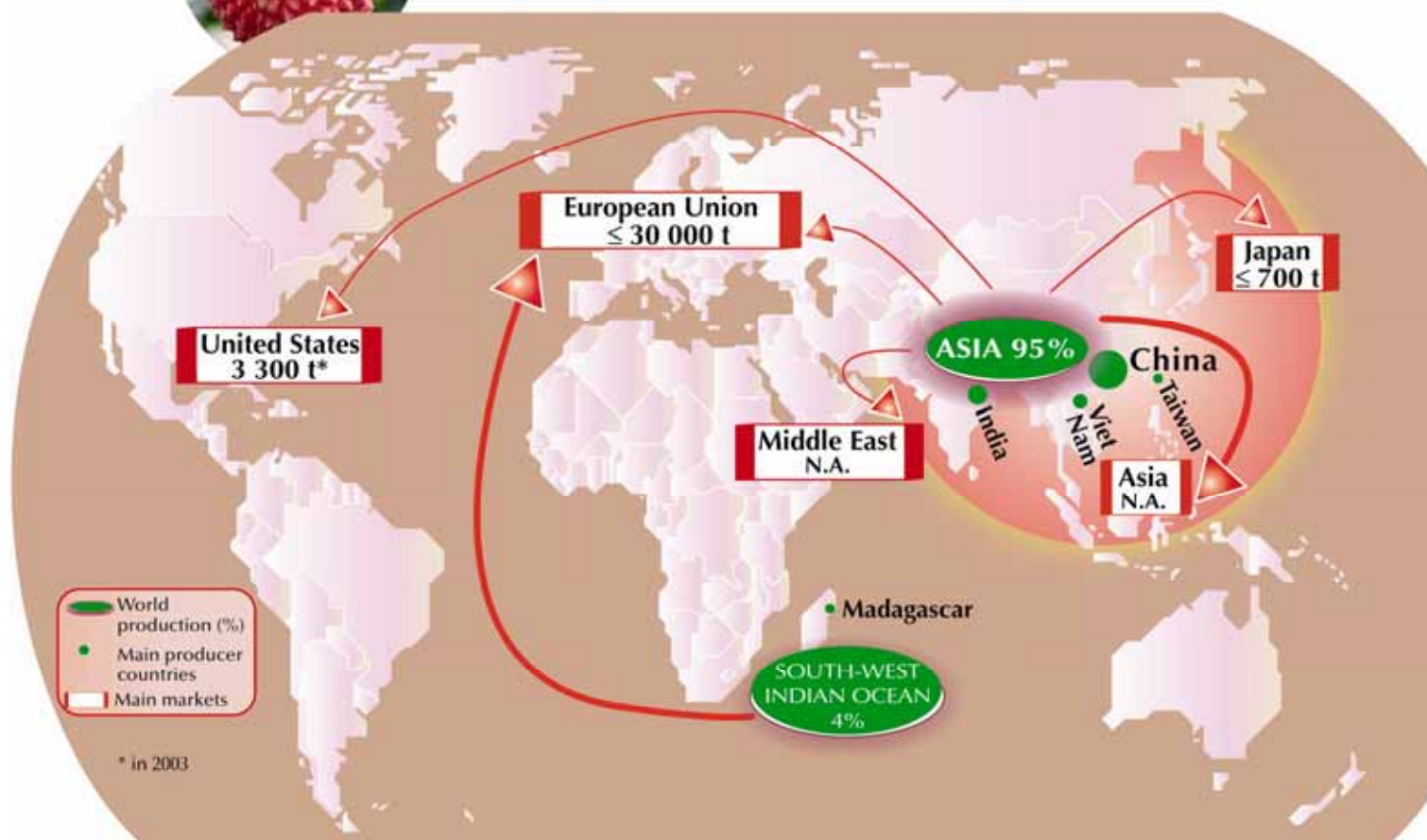


Pierre Gerbaud, Consultant
pierregerbaud@hotmail.com



Litchi...

estimated world production: 2 550 000 tonnes



Litchi — World production — Tonnes

Country	Production	Production region	Source
China	1 446 000	South-east (mainly Guangdong, Guangxi and Fujian)	MOA 2006
India	620 000	East and north (mainly Bihar 60 to 70% and western Bengal, 15 to 20%)	Dac, 08-09
Vietnam	156 000	North (mainly Bac Giang, Hai Duong, Quang Ninh)	Professional sources, 2006
Taiwan	108 612	Centre and south	Taiwan Agricultural Research Institute (2007)
Thailand	43 000	Mainly north (Chiang Mai, Chiang Rai) and centre (Samut Songkhram)	Agricultural Economics office, 2007
Nepal	14 000	Mainly in the central plain and the west	Ministry of Agriculture Nepal, 1998-99
Bangladesh	13 000	Whole country, mainly along western border	Bangladesh Bureau of Statistics, 1997-98
Pakistan	3 000	Punjab	Ministry of Agriculture, Pakistan, 2005-06
Total Asia	2 403 612		
Réunion	12 000	South-east (Sainte Suzanne to Sainte Rose), south-west (Saint Pierre to Saint Philippe)	Professional sources
Madagascar	100 000	Mainly Toamasina (between Feonarivo and Brickaville) (Manakara and Fort Dauphin)	Professional sources
Mauritius	4 500	Centre (Plaines Wilhems district), north (Pamplemousse, Flack and Rivières du Rempart districts)	Professional sources
South Africa	8 600	70% Mpumalanga, 24% Limpopo, 5% Kwazulu-Natal	Subtropical Growers' Association, 2007-08
Total SW Indian Ocean	125 100		
Australia	6 000	90 % Queensland, 10 % New South Wales	Austr. Lychee Growers' Association, 2001
Mexico	15 680	Above all in the centre (San Luis Potosi) and south of the Gulf of Mexico (Vera Cruz, Puebla, Oaxaca)	Professional sources
Israel	1 200	The coast and the Jordan Valley	Professional sources
United States	600	Above all in southern Florida (Miami Dade county), Hawaii, California	IFAS, USDA, 2001
Spain	nd	Malaga	
Total others	23 480		

Litchi, tamarind, cashew apple, jackfruit, sapotilla — European Union imports

Tonnes	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total	13 573	19 481	23 261	21 973	25 694	29 260	30 673	30 374	27 845	37 250	36 159	22 818	29 850
Total extra-EU, of which	13 023	18 886	22 700	21 756	25 347	28 397	30 114	29 454	26 989	36 077	34 743	20 096	29 154
Madagascar	10 378	12 448	18 695	16 647	18 178	17 480	20 635	21 121	18 235	28 722	26 295	14 284	11 316
South Africa	1 645	4 240	2 012	3 044	2 977	7 148	5 042	2 787	3 419	1 542	4 614	1 606	3 622
Thailand	280	1 070	1 061	890	1 192	1 534	1 578	2 466	2 618	2 088	2 050	2 121	1 549
Bangladesh	-	4	10	3	9	3	43	40	61	578	290	239	398
India	27	21	41	78	380	819	763	607	647	564	83	141	11
Pakistan	-	2	10	4	1 432	86	288	366	532	520	14	404	10
Israel	303	698	551	621	636	489	873	932	428	630	1 066	903	753
Mauritius	114	94	49	143	122	256	117	232	198	185	183	170	210
China	10	105	39	55	77	38	295	333	131	295	148	228	305
EU production	Spain	550	595	561	218	346	863	560	920	856	1 173	1 416	696

Source: Eurostat - Selection of origins from codes 08109030 (litchi, tamarind, cashew apple, jackfruit, sapotilla), then 08109020 (litchi, tamarind, cashew apple, jackfruit, sapotilla, passion fruit, carambola, pitahaya) from 2008

Litchi, rambutan, carambola, passion fruit — Japanese imports

tonnes	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total	976	1 977	1 832	1 601	1 452	332	891	654	697	581	311	368	524
China	129	877	1 010	800	1 150	178	689	426	569	445	150	209	349
Taiwan	718	940	576	286	187	33	162	199	108	97	124	129	131
Mexico	26	11	29	33	19	32	8	8	17	37	35	30	41
Thailand	97	138	155	349	20	3	0	0	0	0	0	-	-
Australia	0	0	52	123	75	84	28	21	1	0	0	-	1
Others	5	11	10	11	2	1	4	1	2	1	0	0	2

Source: Japanese customs, code 81090210

Litchi — Production calendar

	M	A	M	J	J	A	S	O	N	D	J	F
Asia	China											
	India											
	Taiwan											
	Thailand											
	Vietnam											
	Nepal											
	Bangladesh											
Indian ocean	Réunion											
	Mauritius											
	Madagascar											
	South Africa											
Others	Australia*											
	United States											
	Mexico											
	Israel											
	Spain											

* Australia: Queensland from the beginning of November to the end of January and New South Wales from the beginning of January to the end February

Litchi quality defects

Photos © Pierre Gerbaud



Ageing fruits – dull appearance –
shell browning and drying



Puffy fruits



Fruits picked too early



Ageing fruits – too long a gap
between harvesting and sale



Puffy fruits



Unattractive colour
resulting from lack of sorting



Oxidation of the shells
of non-treated fresh litchis



Aborted and double fruits



Satisfactory colour (for reference)



Uneven colouring
resulting from sulphur treatment



Different sizes
in the same packaging



Stalk torn off



Moulds (*Penicillium*)



Black rot (*Aspergillus* spp. and *Pestalotiopsis*) and mould



Mould spots (*Penicillium*)



Strong mould attack (*Penicillium*)



Sulphur dioxide burn damage and double fruit



Spread of mould spots (*Penicillium*)



Black rot (*Aspergillus* spp.) and mould



Sulphur burn as the fruits were wet before treatment



Rots and isolated moulds (*Penicillium*)



Black rot (*Aspergillus* spp.)



Burn caused by sulphur treatment and moisture



Cultivation of litchi

by Christian Didier



© Guy Bréhinier

Requirements of litchi

Specific climatic conditions are required for litchi growing but the tree is not very fussy about soils. It is also little susceptible to viral diseases.

Cultivation zones

Litchi requires a warm, humid climate. In order to flower, it needs a vegetative resting period induced by a cool, dry season. A slight fall in temperature and relative humidity may induce flowering in some humid zones. A good supply of moisture is essential from the appearance of the flower spikes until harvesting.

Windbreaks

The position of the land must allow good lighting. Poorly drained low-lying land should be avoided, as should steep slopes that hinder the mechanisation of maintenance work. The land must be sheltered from the prevailing winds and from sea spray near the coast. If there is no natural protection (relief, vegetation), windbreaks are installed around the field and even inside it if it is large or very exposed. Wind breaks consist of fast-growing trees with good anchorage in the ground (filao, shisham, acacia and others) planted in dense rows and require maintenance (fertilisation, irrigation and pruning). They must be allowed sufficient space.

As far as possible, wind breaks should be installed a year before the litchis are planted to give protection from planting onwards. A wind break provides protection for a distance equal to ten times its height. They should be planted closer together in sloping land. They sometimes do not have any effect in extreme cases.

Soils

Litchi adapts to numerous types of soil but prefers slightly acid soils (pH 5.5 to 6.5 and 8 or higher in some parts of India) that are rich in organic matter, deep and well drained. Although it can stand having 'wet feet' temporarily near rivers, prolonged submersion can be harmful. Drainage is all the more important as litchi is grown in zones with high rainfall and often in low-lying areas protected from wind.

The creation of orchards

Soil preparation

Planting in recently cleared land in which stump and root debris enhance the development of root rots should be avoided. If necessary, surface drainage is ensured by levelling and subsoil drainage by a network of ditches. If cultivation can be mechanised, deep subsoiling is followed by ploughing, possibly after the application of manure and phosphate and potassium fertiliser (in the light of the results of soil analysis). When the trees are planted in holes, inputs are applied at this stage.

Plants

Propagation is usually by air layering using trees noted for the quality of their production. The layers obtained during the hot, humid season from branches 10 to 15 mm in diameter and 0.50 to 0.70 m long have a small necrotic root point at the cut that heals quickly. The root system is also better balanced with the aerial part. After separation, the marcots are cultivated in pots in a nursery for 3 or 4 months before being transplanted to the orchard.

Plantation density

The litchi tree displays considerable growth. Today, planting distances are 10 x 10 m or 8 x 10 m, that is to say a density of 100 or 125 trees per hectare. Nevertheless, plantation at 8 x 6 m (208 trees per ha) or 8 x 5 m (250 trees per ha) can be envisaged in more intensive cultivation. Annual pruning is necessary in this case. The orchard can be thinned by gradually cutting back the trees when they begin to hinder each other and then, in the absence of an effective pruning method, by felling one tree in two along the row.

Planting

Planting must be performed with a strict layout and perfectly aligned in each direction. If cultivation is not mechanised, a 0.8 x 0.8 x 0.8 m (500 litres) hole must be dug at the position of each seedling. The soil removed is then mixed with about 2 kg potassium sulphate + 2 kg natural phosphate + 25 to 30 kg well-rotted manure. The hole is then refilled with this mixture. A slight mound is formed as a result of the manure application and the expansion of the soil. The plants are installed in the mound and staked.

Marcots are planted inclined in the opposite direction to the wind and staked. They are thus less exposed to the wind and root better. The plants must always be watered abundantly after planting. In cool zones, they must be sheltered during the winter following planting.

Orchard maintenance

Training pruning

As for other fruit species, it is sought to train the tree on a single trunk with horizontally spaced, regularly distributed main branches. Care must be taken in the early years to prevent the forming of shoots on the trunk or the main branches that have a very closed angle, following the natural tendency of litchi. These shoots are extremely weak points during strong wind.

Soil maintenance

The soil must be bare along the rows or under the foliage in the early years. Spontaneous inter-row vegetation must be kept down. Short-cycle, small growth intercrops can possibly be grown during the first three years and managed in such a way as not hinder the trees.

Irrigation

Litchi is very susceptible to water stress throughout the fruit growth period and the vegetative growth period that follows the harvest. Irrigation is necessary in case of shortage of water. Stress during fruit setting causes substantial fruit drop. Different irrigation systems can be envisaged. Microjet irrigation is satisfactory. At least 200 mm water per month must be applied (according to soil type, the age of the trees, the climate, etc.).

Maintenance pruning

The fruits are in clusters at the extremities of the branches. The latter are broken at harvesting. However, this practice does not enable control of the volumes of the trees. The removal of dead wood, of small inner branches and branches that prevent sunshine from entering the tree is recommended.

Litchi growth is fast and soon becomes exuberant. The trees must therefore be controlled. For this, annual pruning is performed just after the harvest. The trees are usually too dense. The aim is to aerate them by allowing as much light as possible on the foliage and to keep them at a suitable height to make harvesting easier. The final result of pruning should be dome-shaped trees.

Fertilisation

Fertilisation is an important factor. It promotes good vegetative growth after the harvest and makes up for the exporting of minerals in the fruits. After the active vegetative growth period of about four months, litchi needs a short period of stress (nutritional, water, heat or other) to allow flower induction.

Doses are modulated according to the date of application:

- after the harvest: 1/2 of the dose;
- at panicle emergence: 1/4 of the dose;
- after 'June drop': 1/4 of the dose.

Fertiliser is applied to the ground beneath and at the limit of the foliage. Trace elements are applied by leaf spraying at fruit setting (boron, calcium).

Harvesting

Traditional harvesting is performed by hand with 'bunches' of fruits of the branch stored in bales or crates containing 10 to 15 kg only so that the fruits at the bottom are not crushed. These hand-made bales conserve good humidity around the fruits, preventing them from drying out. It is better to use slightly ventilated plastic crates to avoid crushing the fruits. The treatment and marketing of fruits are rapid to avoid the peel discoloration resulting from drying. Litchi is not a climacteric fruit and its biochemical characteristics change little after harvesting, except for gradual deterioration. Fruit maturity is generally appraised on the basis of colour, peel texture and tasting. It is considered that a soluble dry matter/acidity ratio of 2.1 to 2.7 corresponds to optimum quality.



© Régis Domergue

Litchi - Applications recommended
Grams per tree

Years	N	P	K	MgO
1	50	10	40	15
2	80	10	60	20
3	140	30	105	40
4	210	45	160	55
5	230	65	265	80
6	380	85	345	105
7	470	105	430	125
8	570	125	520	155
9	670	150	610	180
10 years and +	920	210	840	240

Pests and diseases

Warning: treatment must be applied in conformity with the regulations in force in the producer country and in the destination country.

Main fruit pests

- ***Cryptophlebia peltastica* and fruitfly**

Cryptophlebia lays eggs on immature fruits. The small caterpillars bore into the fruit to the seed for the nymph stage. The wound opens the way for other pests, especially fungi and fruitflies.



© J.F. Vaysières

C. Peltastica

Main foliage pests

- **Scales**

Scales can infest fruits, leaves, stems, branches and the trunk. When numerous, they cause the withering of leaves and shoots. Leaves often display yellow spots where they have been pricked. Scale infestation is often accompanied by sooty mould.

- **Mites:** *Aceria litchi* (Erinose mite)

This is a serious pest in India and China, attacking flowers and leaves. The leaves crinkle and the undersides acquire a brown coating.



© Christian Didier

Fruitfly

Trunk and branch pests

- **Bark-borer caterpillars**

(*Indarbela quadrinotata* and *I. tetroanis*)

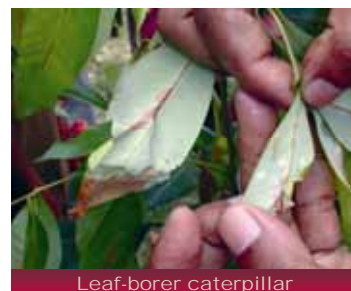
Very common in India. Damage is caused by the larvae that bore into bark and trunk, reducing sap movement and affecting growth.

- **Bark borer:** *Salagena* spp.

The larvae feed on the bark and wood of the tree. The tree does not die but the branches wither. Treatment: these larvae can be controlled by stopping the holes with cotton wool soaked in systemic insecticide.

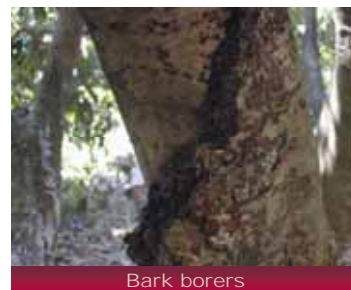
- **Thrips**

Dolicothrips indicus and *Magalurothrips usitatus* cause damage to flowers. *Selenothrips rubrocinctus*, *Heliothrips haemoidalis* and *Franklinella cephalica* cause the withering of flowers and leaves.



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Leaf-borer caterpillar



© J.F. Vaysières

Bark borers

Diseases

- **Root rot**

This is caused by the fungus *Clitocybe tulescens*. Much damage is reported in Florida. *Botryodiplodia theobromae* can cause sudden death of the tree (Australia).

- **Aerial system**

Leaf necrosis caused by *Gloeosporium* spp. This is observed in certain poorly managed orchards.



© Christian Didier

Anthrachnosis

Post-harvest and sulphur treatment

A feature of litchi is that it does not ripen after picking and so it is essential to harvest the fruit when it is fully ripe. However, it deteriorates very rapidly at ambient temperature. The shell browns, dries and becomes brittle in two or three days. Loss of colour results from the oxidation of anthocyanin pigments, an irreversible reaction. The fruit is then more subject to bursting and secondary contamination by fungi.

To prevent senescence before the fruit is sold, litchi can be fumigated with sulphur dioxide; this inhibits respiration and thus conserves texture and organoleptic qualities for several weeks. Sulphur has a fungicidal, anti-oxidant effect that keeps the shell flexible. This treatment can be applied to destemmed fruits or bunches that are sound, ripe, free of spotting, insects pricking and free of traces of damp on the shell. Sulphur is burned in a closed chamber containing the fruits. It causes the shells to turn yellow, whereas they are naturally pinkish red when the fruits are ripe. The fruits are then sorted again and packed. They remain yellow for as long as they are kept chilled. The colour gradually changes to pink ochre or purplish red when they are under warmer, moist, ventilated conditions allowing the elimination of the sulphur.

Sulphur treatment is the cornerstone of litchi marketing insofar as it lengthens conservation time, giving access to sea transport and hence large-scale exports. The procedure is used for several other fruits such as table grapes and dried fruits and it is also used for wines. The main difference is that litchi shells are not edible. Sulphur treatment is permitted in Europe under certain conditions. Consumer health protection regulations stipulate that the residual sulphur content must not exceed 250 mg/kg in the shell and 10 mg/kg in the fruit pulp. Numerous experiments have been conducted to define treatment procedures so that these limits are respected. Both professionals and the European authorities pay close attention to the question. Numerous control operations are performed throughout the life of the fruit in order to ensure that the regulations are respected. The gradual setting up of certification by operators should enhance product traceability and the mastery of treatment operations.

The continuation of use of sulphur is called into question from time to time. Indeed, with the general evolution of regulations towards the protection of consumer health, there is a great risk of heading towards a reduction in residue levels at best and at the worst the forbidding of treatment. One of the role of the sector is therefore to pay great attention to changes in the regulations concerning this point. A search for new conservation methods can also be an important approach. Unfortunately, litchi does not have sufficient economic weight to mobilise the resources required for such research, as is the case for other fruits.

Temperature during storage and transport is another key component in maintaining fruit quality in time. Indeed, chilling after harvesting, treatment and packing is performed by the transport facilities used. Here, it will be noted that litchi is one of the few tropical fruits that can withstand low temperatures ($1^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$). The combination of sulphur treatment and chilling allows good conservation of litchi. Fast chilling to the heart of the fruit is important for maintaining quality. Chilling must then be maintained to ensure as long a life as possible for the fruits. Any change in temperature may cause fruit deterioration and senescence.



before sulphur treatment



after sulphur treatment

© Christian Didier



Litchi varieties

by Christian Didier

Litchi sinensis Sonn.
Sapindaceae
Origin: Southern China (Canton region)

A great number of varieties exist around the world. Only those seen on export markets are mentioned here.



Shahi (Muzaffarpur)

The fruits are medium-sized (20 to 25 g), bright pink and in clusters. The pulp is sweet. This is the most common variety in Bihar State in India. It is of very good export quality but susceptible to cracking and sun-scorch. The trees are vigorous with steady production (80 to 100 kg per tree).



Kwai mi (Mauritius, Tai So)

The fruits are medium-sized (22 to 25 g) and bright red in clusters of 12 to 30. Fruit quality is good. This is the most widespread variety in the Indian Ocean. Production is steady with little alternate bearing. The trees are of medium vigour slender.



Rose scented

The fruits are medium-sized (16 g), globular and heart-shaped. The pulp is very sweet with an aroma of roses, whence its name. The variety is grown mainly in Uttaranchal in India.



Haak Yip (Black leaf)

The fruits are medium-sized (20 g), dark red and in clusters of 15 to 25. The peel is smooth and hard. The pits are medium to large. The flesh is good to excellent, sweet and aromatic and forms 70 percent of the fruit. The trees are of medium vigour, compact, straight and bear well.



Chakrapad (Emperor)

A large heart-shaped fruit (32 g). The skin is thin and flexible, dark red with yellow patches. Moderately juicy, the pulp may remain slightly acid. Fairly large stone. The trees are of average vigour with an erect habit, long branches and dense foliage.