

No. 248

April 2017

FRUITROP magazine

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English edition

Banana

Long may the party
continue!

Avocado

In the Peruvian
mists

Southern Hemisphere apples:
adopting the right tactics

Inter-season grapes:
more difficult than predicted

+ TRANSPARENT

CULTIVATED AND CONTROLLED IN FRANCE

+ ENVIRONMENTALLY

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Storm warning! The acrimony expressed by certain politicians and nations against imports has been of uncommon vehemence in recent months. The pendulum of globalisation, embodied by market deregulation, had swung so far and so out of control that all of a sudden it is swinging back, with no brakes. Companies from the North, though this region is the big initiator and organiser of this globalisation, are getting the shivers. While in the South, the marginalised and losers of this blessed opening up to the world have never complained, or while they have not been audible until now, this is not the case for those marginalised from the system who live in the North. They are now making themselves heard via the ballot box. Often irrational, their anger is shifting the lines. Importing in their eyes is seen as the kingpin of this economic and social downgrading. Especially since clichés have it tough and national competitors, as well as certain NGOs and many professional protestors, are waving the red rag of mistreatment of the Southern peoples and their environment. Fortunately, there is growing awareness that the South has the right to development, the same economic development which brought the nations of the North out of deep poverty. All nations aspire to access basic services, such as an adequate and balanced diet, the possibility of social mobility via an effective education system and albeit minimum access to healthcare. Where do the companies, sometimes transnationals, established in the South fit into all that? Well, they first need to weed out the rotten apples who still too often tarnish their image, and demonstrate to the world the positive impacts of their presence and their production and export activities. Then the outlook of the marginalised in the North might just change somewhat, as they will have proof that their suffering is not twofold: their own and that of the Southern populations.

Denis Loeillet



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Wholesale market prices in Europe

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Cover photograph: © Denis Loeillet

Banana

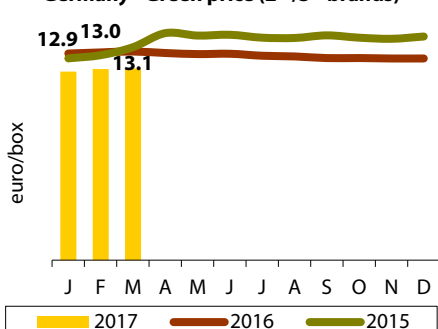
March 2017

After a difficult start to the year, the banana market regained some momentum in March. The overall supply continued its seasonal rise, but regained slightly lower levels than in 2016. Despite very high Colombian volumes (+ 32 %), the overall dollar banana supply to Europe remained smaller than in 2016 because of declining levels from Ecuador and Costa Rica. Meanwhile African volumes, on their seasonal increase, were above average (+ 20 %), yet were unable to offset the still highly acute shortfall from the French West Indies. Hence the combined volumes from these two sources remained 4 % below average. In addition, their sales significantly gathered pace in Northern Europe and above all Eastern Europe, where promotions were launched and where the presence of seasonal fruits remained scarce (early end to citrus campaigns, delayed strawberry campaigns). Prices, hitherto stagnant, strengthened from the beginning of the month in Eastern Europe and toward mid-March in Western Europe. Only the Spanish market proved more difficult because of rising volumes from the Canaries, at above-average levels.

NORTHERN EUROPE — IMPORT PRICE

March 2017 euro/box	Comparison	
	previous month	average for last 2 years
13.07	0 %	- 9 %

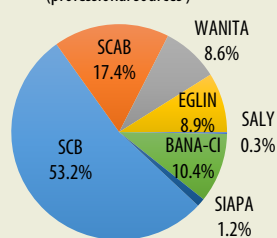
Germany - Green price (2nd/3rd brands)



■ **Côte d'Ivoire targeting banana exports of 500 000 tonnes.** Africa's leading exporter to the EU in 2016 with 308 000 t, Côte d'Ivoire is not resting on its laurels. The establishment of new operators and the extension of surface areas from older ones hint that the 500 000-t mark for exports could soon be beaten, although in spite of what some local bosses are saying, this will take another 3 to 5 years to achieve. As at the end of 2016, the planted surface area covered 7 700 hectares. That is 2 000 ha more than in 2012, and growth is rapid. The Ivorian supply will be boosted both by the extensions and new investors' projects (two in progress and one pending planting). On top of which there are two blocks of small rural entrepreneurs (predicted 400 ha in total) which, backed up by large groups, could contribute to the Ivorian supply to the tune of approximately 12 000 t. The European market is no longer the sole target. Domestic demand and demand from the sub-region for quality, standardised fruits is high, and still under-exploited. The potential regional demand is apparently 150 000 t.

Source: CIRAD

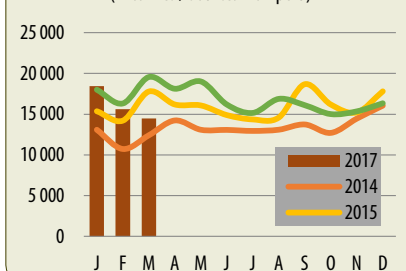
Dessert bananas - Côte d'Ivoire Planted areas by operator - End 2016 (professional sources)



■ **Tension on the organic banana market.** Following El Niño Costero, the northern coast of Peru was hard hit by rains and floods. Of this zone's 7 500 ha of organic bananas, nearly 2 000 ha was reportedly affected by this intense rain around mid-March. Hence exports, after rising for the past decade, and which exceeded 200 000 t in 2016, have been down since February. Although there are no direct losses to rue according to official sources, yields are falling (soil saturation and less sunshine), while the damaged road infrastructures have prevented access to the packing stations and ports. Volumes exported in February and March were 11 % below the average for the past two years, with an especially marked drop on the US market (- 38 %). Despite trade-offs still favouring the EU because of good demand, quantities have come undone since March, and are 8 % less than last year. If we add the waning production from Ecuador, also hit by the rains caused by El Niño Costero, and the Dominican shortfall due to the floods of October 2016 (Cyclone Matthew), the organic banana market could remain under tension at least until mid-2017.

Sources: Promperu, CIRAD

Organic bananas - Peru - Exports (in tonnes / Source: Promperu)



EUROPE - RETAIL PRICE

Country	March 2017		Comparison	
	type	euro/kg	February 2017	average for last 3 years
France	normal	1.66	+ 1 %	+ 3 %
	special offer	1.37	- 6 %	+ 3 %
Germany	normal	1.35	+ 2 %	+ 1 %
	discount	1.16	0 %	- 2 %
UK (£/kg)	packed	1.05	0 %	- 4 %
	loose	0.75	0 %	+ 5 %
Spain	platano	2.09	0 %	+ 6 %
	banano	1.32	+ 1 %	- 1 %

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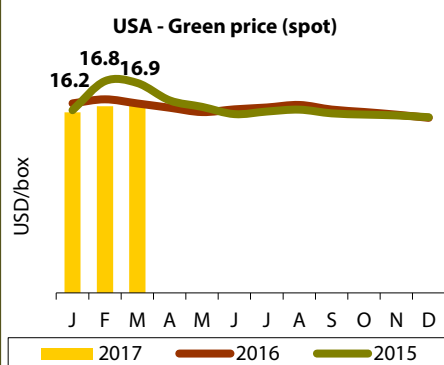


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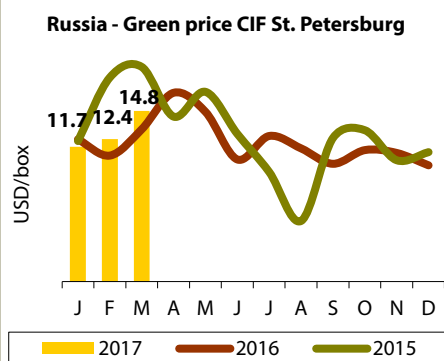
UNITED STATES



UNITED STATES - IMPORT PRICE

March 2017 USD/box	Comparison	
	previous month	average for last 2 years
16.86	+ 1 %	- 6 %

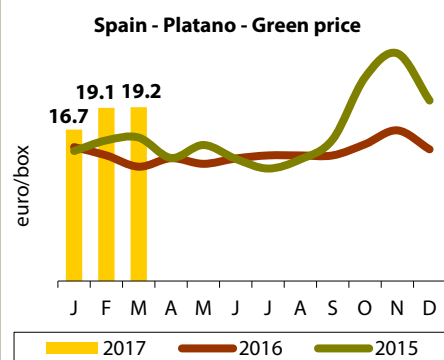
RUSSIA



RUSSIA - IMPORT PRICE

March 2017 USD/box	Comparison	
	previous month	average for last 2 years
14.85	+ 20 %	- 7 %

CANARIES



CANARIES - IMPORT PRICE*

March 2017 euro/box	Comparison	
	previous month	average for last 2 years
19.20	0 %	+ 35 %

* 18.5-kg box equivalent

Early 2017 banana consumption: EU still at the heights, USA still stable.

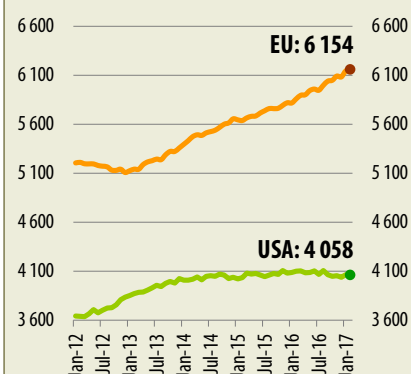
European banana consumption remains sky-high. Indeed a new absolute record was set for a twelve-month period (March 2016-February 2017: 6 154 000 tonnes). This is 5 % better than the previous period (March 2015-February 2016). Over the first two months of 2017, the supply (imports + EU production) climbed by 7.4 %! After a strong supply surge in January (+ 13 %), February was back to normal with just 2 %. It was the dollar origins which saw the biggest rise, with imports up by 13.5 % over the first two months (especially Costa Rica and Ecuador). The ACP group was very mixed in its trends, with African origins up by 5.6 %, while the other ACPs went down by 11 %. European production saw another big fall (- 21 %), hampered by the absence of two-thirds of volumes from Martinique and by a quarter of volumes from Guadeloupe.

In the United States, the supply rose by 3.1 % over the first two months of 2017. Guatemala, Costa Rica, but also Honduras and Mexico, registered two-figure growth rates. This was insufficient for the moment to reverse the twelve-month supply curve. The market is doing no more than holding up slightly above 4 million tonnes, at 4 058 000 t.

Source: CIRAD

Banana - EU & USA - Estimated supply 12-month sliding basis (March to February)

(in 000 tonnes / Sources: CIRAD, Customs, Eurostat)



Banana – EU & USA – Supply from January to February 2017 (provisional)

000 tonnes	2015	2016	2017	2017/2016 difference
EU-28 - Supply	944	984	1 057	+ 7 %
Total import, of which	845	883	977	+ 11 %
MFN	692	711	807	+ 13 %
ACP Africa	81	100	106	+ 6 %
ACP others	72	72	64	- 11 %
Total EU, of which	99	101	80	- 21 %
Martinique	30	26	9	- 66 %
Guadeloupe	11	8	6	- 24 %
Canaries	54	63	61	- 3 %
USA - Import	722	744	764	+ 3 %
Re-exports	88	92	91	0 %
Net supply	633	653	673	+ 3 %

EU sources: CIRAD, EUROSTAT (excl. EU production) / USA Source: US Customs

EUROPE - IMPORTED VOLUMES - MARCH 2017

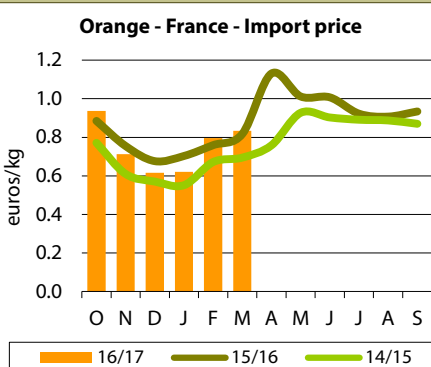
Source	Comparison		
	February 2017	March 2016	2017 cumulative total compared to 2016
French West Indies	↗	- 57 %	- 56 %
Cameroon/Ghana/Côte d'Ivoire	↗	+ 10 %	+ 14 %
Surinam	↗	+ 31 %	- 31 %
Canaries	↗	+ 1 %	+ 12 %
Dollar:			
Ecuador	↘	- 12 %	- 2 %
Colombia*	↗	+ 17 %	+ 9 %
Costa Rica	=	- 19 %	+ 3 %

Estimate made thanks to professional sources / * total for all destinations

Orange

March 2017

Despite the arrival of spring and the traditional seasonal fall in demand, the orange market tightened up throughout the month. Indeed, the Spanish Navelate shortfall intensified and the end of the campaign was brought forward due to the early marketing schedule and production losses (end-of-year rains). So prices strengthened throughout the month, at both the import and production stages. Sales of Salustiana, whose campaign also started to wind down, gathered pace, though volumes were insufficient to make up for this shortage. So the Spanish Valencia Late came onto the market early, with prices firm and above average for the season.

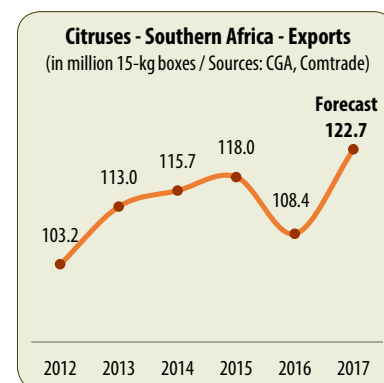


■ Southern Africa citrus export forecasts for 2017: back to growth!

The 2016 recession should be no more than a hiatus. The CGA is reckoning on record exports of 123 million boxes in 2017, a figure up by 13 % on 2016, and 8% above the four-year average. This forecast reflects both the harvest returning to normal in the northern production zones, hit by frost and drought in 2016, and the main trends of the cultivation area. Not all the citrus families are in the same boat. The export potential is only returning to its 2015 level for the orange, with Navel and Valencia both registering average potential. Similarly, exports should be similar to 2015 and average for the grapefruit, despite the cultivation area losing nearly 2 000 ha between 2013 and 2015. The increase is of course to be found for easy peelers and the lemon, planting of which has seen a massive boom since the beginning of the decade (which has only intensified in the past two years – see FruiTrop 247). Exports should set a record level of 13.2 million boxes for easy peelers, and 17.5 million boxes for the lemon, both figures up by 15 to 20 %

from last season, and 30 to 35 % above average. Unlike the previous season, rainfall has been good in the north, but sparse in the south (Western Cape especially), where the sizing should be toward the bottom of the range.

Source: CGA



Citruses – Southern Africa – Exports and forecasts for 2017

in million 15-kg boxes	2012	2013	2014	2015	2016	2017	2017 / 2016	2017 / 2013-2016 average
Easy peelers	7.6	8.4	10.0	10.0	11.2	13.2	+ 18 %	+ 33 %
Lemon	10.7	10.6	13.2	15.1	15.1	17.5	+ 16 %	+ 30 %
Total oranges	71.9	76.2	76.9	77.2	68.3	76.4	+ 12 %	+ 2 %
Navel	24.6	25.4	26.0	24.5	26.2	26.3	0 %	+ 3 %
Valencia	47.3	50.8	50.9	52.7	42.1	50.1	+ 19 %	+ 2 %
Grapefruit	13.0	17.8	15.6	15.7	13.8	15.6	+ 13 %	- 1 %
Total	103.2	113.0	115.7	118.0	108.4	122.7	+ 13 %	+ 8 %

Source: CGA

PRICE	Type	Average monthly price euro/15-kg box	Comparison with average for last 2 years
	Dessert orange	12.60	+ 9 %
	Juice orange	11.70	+ 11 %

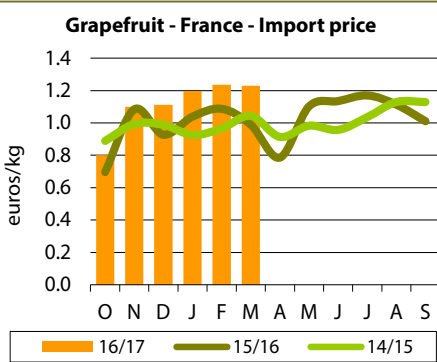
VOLUMES	Type	Comparison
	previous month	average for last 2 years
	Dessert orange	↘ - 14 %
	Juice orange	↘ + 20 %

VOLUMES	Varieties by source	Comparison	Observations	Cumulative total / cumulative average for last 2 years
	previous month	average for last 2 years		
	Spanish Naveline	↘ + 5 %	End of campaign.	- 7 %
	Spanish Navelate	↘ - 14 %	On the wane early due to campaign ahead of schedule, and export potential revised downward (production losses).	- 4 %
	Spanish Salustiana	↘ + 20 %	Campaign winding down, bigger volumes than in other years.	+ 8 %
	Spanish Valencia late	↗ + 139 %	Early start with rapid progress.	+ 130 %

Grapefruit

March 2017

Despite demand idling because of the arrival of spring, the limited supply levels helped the market maintain its balance. The last shipments from Florida arrived, and limited stocks were available. Thanks to the small volumes, prices were able to remain firm and high. The Mediterranean grapefruit supply also started to wind down early: some Turkish batches comprising small sizes remained available, Israeli imports waned into shortfall in March (picking and trading priority given to Or) and the Spanish supply started to wane early because of the early trading campaign. Hence prices for Mediterranean grapefruits strengthened throughout the month, reaching above-average levels.



Sources: AILIMPO, CIRAD

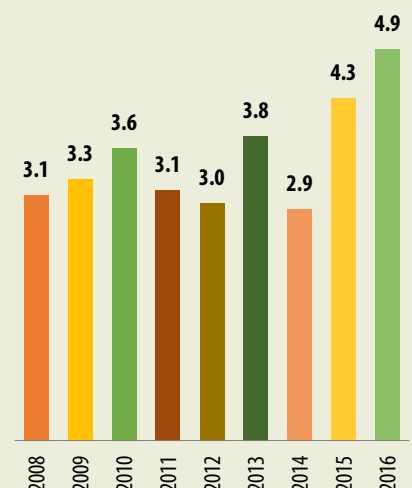
■ **Spanish lemon: start of a big campaign for Verna.** AILIMPO, the Spanish lemon and grapefruit interprofessional association, is predicting a Verna lemon harvest of approximately 300 000 t for the 2016-17 season. That is just over a return to normal, after a 2015-16 campaign marked by exceptionally low volumes. Rainfall was abundant (more than 500 mm since the beginning of the season), and new orchards are entering production. The sizing is also set to be much higher than in 2015-16. Furthermore, the harvest levels should be fairly good in Argentina (although a bit lower than in 2016), and set new records in South Africa. So the spring and early summer market are set to be very different from 2016, when prices peaked at record levels.



■ **Corsican grapefruit: increasingly significant diversification.** Clementines are not the only citrus on Corsica. The grapefruit cultivation area continues to expand, though it remains very modest in extent. There were just over 170 ha in 2016 (with sixty or so hectares certified organic), i.e. an increase of thirty or so hectares since obtaining the PGI in 2014. Volumes marketed outside of the Isle of Beauty have followed the same trend, going from approximately 3 000-3 500 t per year to nearly 5 000 t in 2016 – a new record. The fruit sizing should be more generous in 2017, though with similar availability to 2016 – just a break in growth!

Sources: AOP Fruits de Corse, Agreste

Corsican grapefruit
Shipping outside the island
(in 000 tonnes / source: AOP Fruits de Corse)



PRICE	Source	Average monthly price euro/17-kg box equivalent	Comparison with average for last 2 years
	Mediterranean	15.60	+ 45 %
	Florida	21.15	+ 9 %

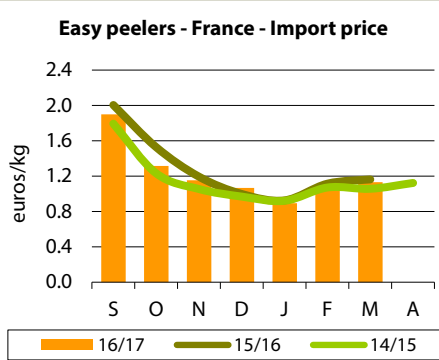
VOLUMES	Source	Comparison	
		previous month	average for last 2 years
	Israel	=	- 30 %
	Florida	↘	- 37 %

VOLUMES	Source	Comparison		Observations	Cumulative total / cumulative average for last 2 years
		previous month	average for last 2 years		
	Spain	↘	+ 39 %	Fall starting early due to early trading campaign.	+ 22 %
	Israel	=	- 30 %	Incoming shipments in shortfall (trading priority given to Or).	0 %
	Florida	↘	- 37 %	Run-up to the end of the campaign, last significant incoming shipments, though still in shortfall.	- 31 %

Easy peelers

March 2017

The arrival of spring and the first seasonal fruits marked the traditional turning point in demand for easy peelers. However, the overall moderate supply helped the market maintain a good balance: Spanish Nadorcott volumes started to wane prematurely, due to quality problems associated with the rains of late 2016 and the early start of the campaign. Similarly, the Moroccan Nadorcott supply was limited (shipments focused on other European markets). Finally, the Spanish Ortanique entered its final market phase, and started to ebb. Only the Israeli Or maintained high levels. Hence prices remained firm for high-quality merchandise at the end of the campaign.



PRICE	Source	Average monthly price euro/kg	Comparison with average for last 2 years
	Clementine	0.75	- 13 %
	Hybrids	1.53	+ 17 %

VOLUMES	Source	Comparison	
		previous month	average for last 2 years
	Clementine	↘	- 6 %
	Hybrids	↘	+ 17 %

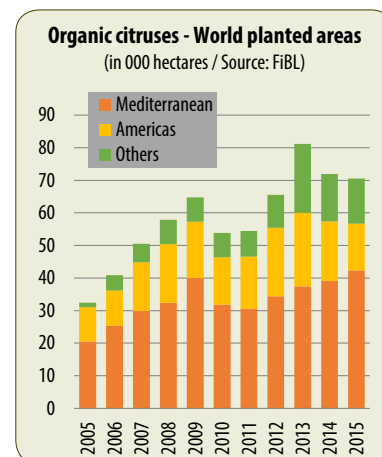
VOLUMES	Varieties by source	Comparison		Observations	Cumulative total / cumulative average for last 2 years
		previous month	average for last 2 years		
	Spanish Clementine	↘	- 6 %	End of campaign with volumes in shortfall.	- 7 %
	Spanish Nadorcott	↘	- 22 %	Early end to the campaign due to season starting ahead of schedule and quality concerns associated with rains of late 2016.	+ 2 %
	Moroccan Nadorcott	↘	- 19 %	Very early end to the campaign due to quality concerns. Volumes shipped to France sparse.	- 19 %
	Israeli Or	↗	+ 84 %	Ongoing incoming shipments peak, volumes well above average for previous years.	+ 55 %

■ Organic citruses: toward increasingly high tension, in particular on the US market.

Consumer interest in organic agricultural produce cannot be denied, either in the USA or the EU-28, which saw two-figure market growth between 2014 and 2015 according to FiBL. However, cultivation areas are not following suit! According to this same body, the world organic citrus cultivation area levelled out at just over 70 000 ha between 2014 and 2015, after seeing a drastic fall of more than 10 000 ha between 2013 and 2014. It is once again the number 1 enemy of world citrus growing, namely greening, which is to blame. Surface areas withered away in Cuba (from 4 200 ha in 2009 to 230 ha in 2015), while the other citrus growing giants of the Americas also suffered, with the cultivation area going from approximately 12 000 ha to 7 400 ha in Mexico between 2014 and 2015, and from 7 500 ha to 4 000 ha in the USA between 2013 and 2015. This will crank up the tension on the US market. The European market seems better off. The Mediterranean, its main supplier, has a vast cultivation area of more than 44 000 ha (62 % of world surface areas). Furthermore,

surface areas registered high growth with the regional leaders, Italy (31 900 ha in 2015, + 10 000 ha since 2011), Spain (8 250 ha, + 2 500 ha since 2011) and Morocco (1 500 ha, + 1 000 ha since 2011).

Source: FiBL



Organic citruses – Mediterranean – Planted areas

in hectares	2010	2011	2012	2013	2014	2015	2015 / 2010
Italy	23 424	21 940	25 340	28 816	29 849	31 869	+ 8 445
Spain	5 392	5 856	6 275	6 332	7 020	8 245	+ 2 853
Greece	1 909	1 770	1 521	1 389	1 241	1 295	- 614
Turkey	783	515	693	523	479	354	- 429
France	194	271	299	220	331	343	+ 149
Israel	117	213	256	195	230	220	+ 103
Total	31 819	30 565	34 384	37 475	39 150	42 326	+ 10 506

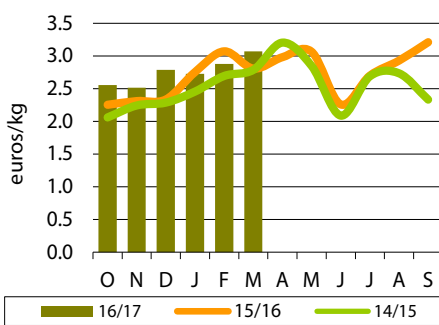
Source: FiBL

Avocado

March 2017

The market continued to tighten up, setting new records. The Hass supply rose to historic levels for a March, 31 % above average. While Chilean shipments continued to ebb (end of campaign), Israeli and Spanish shipments were very high. The supply was topped up by other sources with moderate volumes: Mexico, Colombia, Morocco, Kenya. Nevertheless, the overall supply was below forecasts because of the delay from Peru (large volumes initially predicted at the beginning of the season) and very lively demand. So prices strengthened to high levels, especially for highly sought-after medium sizes. For green varieties, volumes of Israeli Pinkerton continued to wane, while remaining above average, and prices strengthened over the month. The first Peruvian Fuerte became available.

Avocado - France - Import price



PRICE	Varieties	Average monthly price euro/box	Comparison with the last 2 years
	Green	9.95	+ 17 %
	Hass	14.11	+ 28 %

VOLUMES	Varieties	Comparison	
		previous month	average for last 2 years
	Green	↘	+ 52 %
	Hass	↗	+ 31 %

VOLUMES	Source	Comparison		Observations	Cumulative total / cumulative average for last 2 years
		previous month	average for last 2 years		
	Israel	↗↗	+ 107 %	Hass supply much bigger than in previous years (+ 114 %). Ongoing fall in green varieties, though levels still well above average (+ 97 %).	+ 41 %
	Spain	↗	+ 54 %	Shipments peak.	+ 44 %
	Mexico	↘	- 20 %	Shortfall in incoming shipments, small sizes abundant.	+ 9 %
	Chile	↘	+ 29 %	Run-up to the end of the campaign, with above-average volumes.	+ 46 %
	Peru	↗	+ 43 %	First incoming shipments limited and less than forecast, loading delayed due to major logistical problems in late March.	+ 42 %

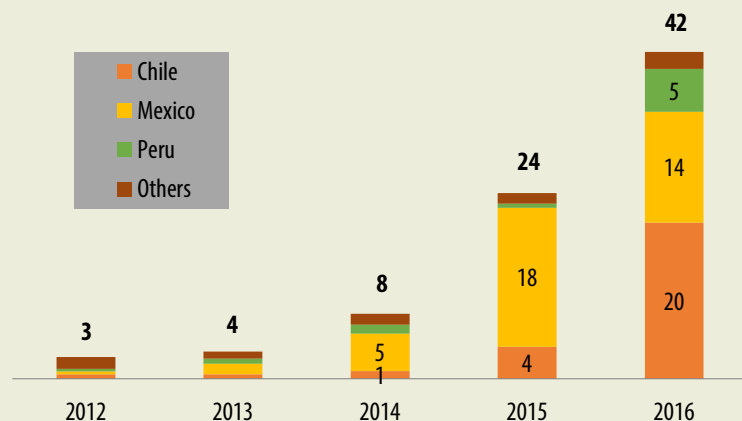


■ **Mission: support and harness the development of the Chinese avocado market.** The Californian Company Mission Produce, which is among the avocado trade leaders in the USA and worldwide, has just opened the first ripening plant in China dedicated to Hass. The unit, which has a total capacity of 80 pallets thanks to its four chambers, is located in Shanghai. This project was conducted in association with the importer Lantao and Pagoda, the country's number one fruit distribution chain (rapidly expanding network of 1 800 stores). The avocados will be sold under the brand "Mr Avocado". With just over 40 000 t of imports in 2016, China is currently still a middling market (world no.5). Nonetheless, the growth dynamic is explosive (rising more than 15 000 t per year in 2015 and 2016). The country is mainly supplied by Chile, Mexico and Peru.

Sources: Mission Produce, Comtrade



Avocado - China + Hong Kong - Imports
(in 000 tonnes / Source: Comtrade)



Mango

March 2017

The supply to the European market was provided by Peru, with substantial shipments in the first half-month, though they dipped thereafter. The fall in Peruvian volumes was offset, at least partially, by a recovery in Brazilian exports, especially for the varieties Tommy Atkins, Keitt and Palmer. The decrease in tonnages was accompanied by a resurgence in demand, which helped rates rise, stabilising at a high level in the second half-month. Prices also strengthened against a backdrop of anticipation of the Peruvian supply fading away. The dramatic storms which hit the country in week 11 probably precipitated the end of the campaign, paralysing the logistical facilities. The opportunistic shipments from Brazil helped maintain a regular supply to the market despite the absence of the more sought-after Kent. The market should see a period of under-supply in April, before the West African campaign progresses (start date 10 April), with high prices in the first half-month given the Easter holidays.

Peruvian air-freight mango prices took off, with volumes rapidly dwindling, especially in the second half-month. Sale prices consolidated at levels rarely reached for this product. Meanwhile, the West African campaign was starting, with the first Amélie shipments from Burkina Faso focusing on the French market. Prices were high for this variety, prized by a hard core of consumers. It was only at the end of the month that the Burkinabe supply diversified with Valencia and Kent shipments.

MANGO - INCOMING SHIPMENTS (estimates in tonnes)

Weeks 2017	10	11	12	13
Air-freight				
Peru	130	100	50	50
Burkina Faso	-	3	5	10
Sea-freight				
Brazil	1 910	1 780	2 200	2 700
Peru	5 230	5 080	4 330	2 600
Côte d'Ivoire	-	-	-	660

Pineapple

March 2017

Throughout the month, the overall pineapple supply was well below demand. The leanness of Latin American production enabled rates to gradually strengthen, while demand remained fairly quiet at the beginning of the month. Speculative sales very quickly became apparent, with volumes and prices constantly increasing from week to week. Over the first half-month, the price increase seemed rather controlled, but from the beginning of the second half-month, shipping delays accentuated the feeling of a shortage. So we saw a genuine surge in prices charged for speculative sales, which were higher than those set out below throughout the month, with peak of up to 18.50 euros per box!

The air-freight pineapple market maintained a positive trend. In the absence of Beninese fruits, the Cameroonian and Ivorian supplies occupied the bulk of the Cay-

enne niche, topped up by some batches from Ghana. The better quality Ivorian supply sold in greater quantity than its competitors. Cameroonian fruits were hit by several quality concerns, though they still sold well in view of the paucity of the overall supply. The Sugarloaf market continued to fluctuate between fluid sales and high rates for coloured batches from Ghana and Togo, and limited sales from green fruits from Benin and Cameroon. The air-freight supply was topped up in the second half-month by some boxes of Sweet from Cuba and the Dominican Republic, which sold on a footing of 2.5 euros/kg.

The overall Victoria supply remained limited throughout the month, which helped operators continue to charge high rates. Despite some quality concerns in the middle of the month, fruits from Reunion sold well.



© Guy Brehmner

PINEAPPLE - IMPORT PRICE IN FRANCE - MAIN SOURCES

Weeks 2017		9	10	11	12	13
Air-freight (euro/kg)						
Smooth Cayenne	Cameroon	1.80-2.00	1.80-2.00	1.80-2.00	1.80-2.00	1.80-2.00
	Ghana	2.00-2.20	2.00-2.20	2.00-2.20	2.00-2.20	2.00-2.30
	Côte d'Ivoire	1.80-1.90	1.90-1.95	1.90-1.95	1.90-1.95	2.00-2.10
Victoria	Reunion	3.00-4.00	3.00-4.00	3.00-4.00	3.00-4.00	3.00-4.00
	Mauritius	3.00-3.60	3.00-3.60	3.00-3.60	3.00-3.80	3.00-3.80
Sea-freight (euro/box)						
Smooth Cayenne	Côte d'Ivoire	9.00-11.00	9.00-11.00	10.00-13.00	12.00-14.00	12.00-15.00
Sweet	Côte d'Ivoire	10.00-13.00	10.00-13.00	11.00-14.50	11.00-15.50	12.00-15.50
	Ghana	10.00-13.00	10.00-13.00	11.00-14.50	11.00-15.50	12.00-15.50
	Costa Rica	10.00-12.00	10.00-13.00	11.00-14.00	12.00-16.00	12.00-16.00

MANGO - IMPORT PRICE ON THE FRENCH MARKET

Weeks 2017		10	11	12	13	March 2017 average	March 2016 average
Air-freight (euro/kg)							
Peru	Kent	4.50-4.80	4.50-5.20	5.00-6.50	6.00-7.00	5.00-5.85	3.90-4.75
Burkina Faso	Amélie	3.50-4.00	3.20-3.50	3.50-3.80	3.00-3.20	3.30-3.60	2.80
Burkina Faso	Valencia	-	-	-	4.00-4.50	4.00-4.50	-
Burkina Faso	Kent	-	-	-	5.00-5.50	5.00-5.50	-
Sea-freight (euro/box)							
Brazil	Keitt	-	-	-	7.00-8.00	7.00-8.00	5.75-7.10
Brazil	Palmer	-	-	-	7.00-8.00	7.00-8.00	-
Peru	Kent	5.50-7.50	6.00-8.00	7.00-8.00	7.00-8.00	6.35-7.85	-

Roots & tubers

Q1 2017

Sweet potato (SP)

Rates were steady for white-fleshed sweet potato from Egypt, which provided a regular supply to the market in Q1. Honduras also shipped the same type of produce, but earned higher sale prices. In mid-February, prices rose slightly, gaining 0.10 to 0.20 euro/kg, and stabilised until late March. At the end of the period, some batches from Portugal made their appearance on the French market, selling at around 1.00 euro/kg, with strong competition from the origins already on the market.

The rates for orange-fleshed sweet potatoes ebbed in January, but took an upturn thereafter. They levelled out in February, before climbing again in March. This general trend was expressed differently between the origins. Israeli produce still obtained the highest prices, followed by Spanish and Honduran produce. Spain consolidated its position with a bigger and more extensive campaign. In the second half of March, the

supply to a market with a slight shortfall was topped up by some batches from the USA.

Some batches of Brazilian white-skinned and fleshed sweet potatoes also went on the market from mid-January to mid-February, and then from the third week of March at a stable price of 1.90-2.00 euros/kg. China shipped some sweet potato batches in February (1.80 euro/kg).

Yam

The yam market was very stable, with three main origins selling at distinct prices. French-produced yams sold at the highest prices, though in fairly limited quantities. From late February, sales proved more difficult, with the product suffering some kind of blockage. The intermediate price range included Brazilian yams, sales of which also became more difficult from mid-February, given the competition from the more attractively priced Ghanaian produce.

Cassava

The rate for Costa Rican cassava varied very slightly within an interval of 0.05 to 0.15 euro/kg throughout Q1. The appearance on the market of lower-priced Ecuadorian cassava influenced the price of Costa Rican produce in March.

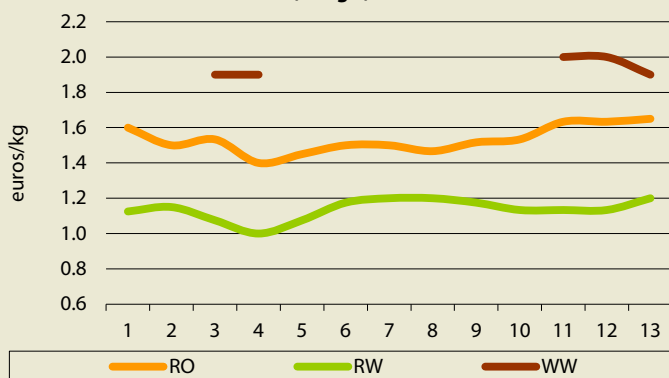
Eddoe

The price of Costa Rican eddoes fluctuated until mid-February, and then fell more significantly in March. Considerable price variation remained between the tuber sizes on the market, between 1.80 and 2.60 euros/kg. Top-up batches from Ecuador were available in February at lower prices.

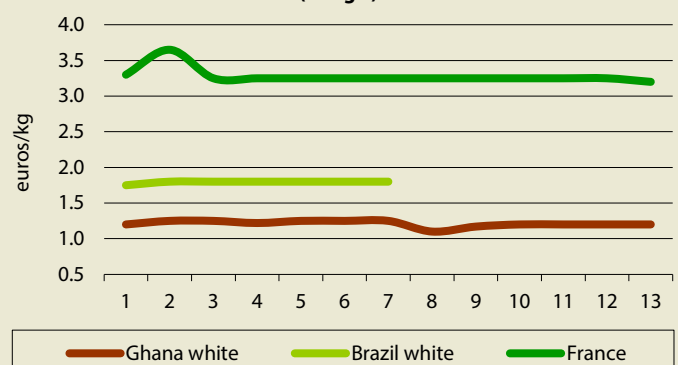


Cassava

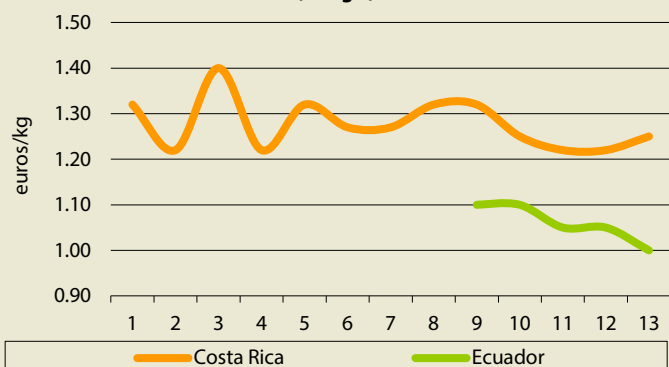
Sweet potato - France - Weekly average wholesale market price (Rungis)



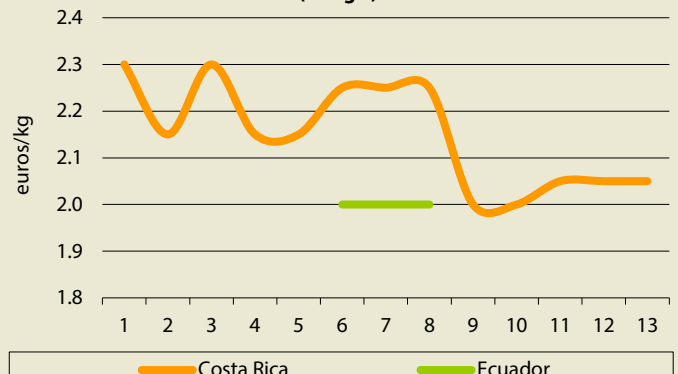
Yam - France - Weekly average wholesale price (Rungis)



Cassava - France - Weekly average wholesale price (Rungis)



Eddoe - France - Weekly average wholesale price (Rungis)



Sweet potato: RO: red-skinned, orange-fleshed / RW: red-skinned, white-fleshed / WW: white-skinned, white-fleshed / Source: Pierre Gerbaud

Other exotics

Q1 2017

Plantain banana

The market saw a rather downward trend, especially for Colombian fruits. Variations in quantities received disrupted sales. The shipment surplus phases caused fruit quality deterioration, generating wide price ranges. Hence the price differences were as much as two-fold depending on the quality of fruits on the market. In March, the situation stabilised with less dense imports of more stable quality. Ecuadorian produce suffered from the price variations of Colombian fruits, which dominated the market in Q1.

Chayote and christophine

The French chayote production campaign finished in January, with some residual batches until February though these were unrepresentative. With the produce quality deteriorating, prices took a downturn for the last batches on sale. The price of Costa Rican chayotes soared in February due to the dwindling

supply. They subsided thereafter until the end of the period. After a dip in late January-early March, the price of Costa Rican christophines returned until the end of March to its initial level in the absence of competition.

Dasheen

Due to a more limited supply, the price of Saint Vincent dasheens increased in the middle of the period. The return of more regular shipments in March pushed sales prices back down to their initial level.

Chilli pepper

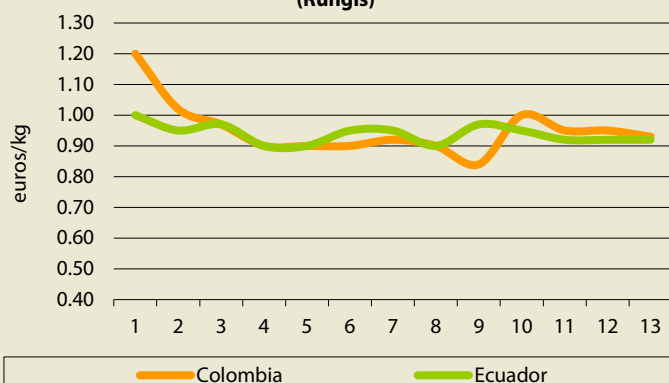
The Dominican Republic remained the main chilli pepper supplier to the French market during Q1 2017. A marked fall in exports from mid-February to mid-March caused a distinct price increase. There were occasional price variations for this produce depending on coloration (numerous batches of green fruit). Meanwhile, shipments from Israel – a new origin for this product – were pro-

gressing. Their rates echoed those of the competition, though at a distinctly higher level. The quality of Israeli merchandise probably explains this price difference, though the produce was criticised for its lack of spiciness. In the middle of the period, the shortfall of merchandise in relation to demand encouraged some operators to find new supply sources. Hence Ugandan peppers came onto the market in the middle of the period, when sale prices were on the up. March saw the start of the Guadeloupe peppers campaign, with a steady sale price of 9.00 euros/kg.

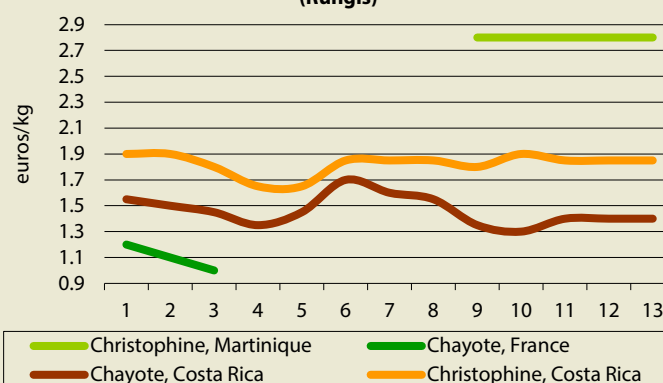


Dasheen

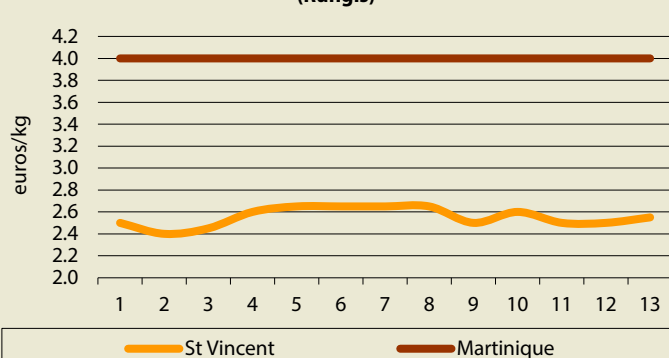
Plantain - France - Weekly average wholesale price (Rungis)



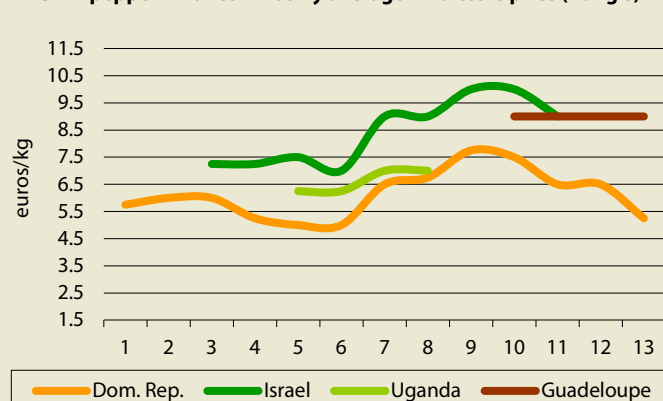
Chayote and christophine - France - Weekly average wholesale price (Rungis)



Dasheen - France - Weekly average wholesale price (Rungis)



Chilli pepper - France - Weekly average wholesale price (Rungis)



Temperate fruits & vegetables

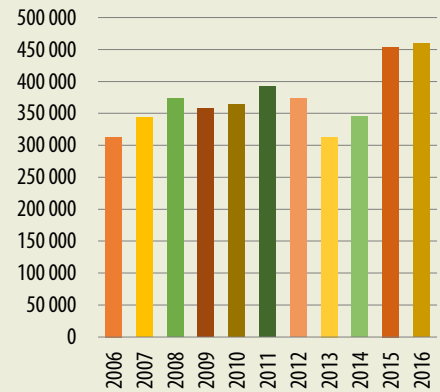


■ **Zespri rejuvenated with the SunGold kiwi.** The very first info from New Zealand's 2017 kiwi production points to a harvest that could be smaller overall than in previous years, because of a fall in yields (- 30 %) for the green kiwi after two exceptionally high years (9 000 to 9 500 t/ha as opposed to 12 000 t/ha). However, the SunGold kiwi harvest is constantly increasing: the orchards, with nearly 70 % in their 3rd year or more, are now practically at full yield. A big communication campaign will be organised in France to celebrate 20 years of Zespri, in particular a three-week TV advert on several channels, and sponsorship on several channel M6 programmes. Communication will also be conducted via a big billposting campaign (3 900 posters) and on the Internet.

Source: Zespri

Kiwi - New Zealand - Exports

(in tonnes / sources: Zespri, Comtrade, USDA / processed by Infofruit)



© Zespri

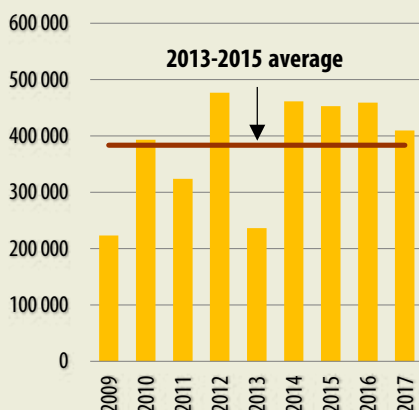
Pear – EU – Stock at 01/03/2017

in tonnes	2017	Comparison	
		2016	2013-2015 average
Conference	293 239	- 13 %	+ 15 %
Abate Fetel	56 636	- 11 %	0 %
Comice	2 753	- 52 %	- 34 %
Others	57 245	+ 10 %	- 15 %

Source: WAPA / Processed by INFOFRUIT

Pear - EU-28 - Stock at 01/03/2017

(in tonnes / source: WAPA / processed by Infofruit)



■ **A lighter pear market.** The Europe-wide pear stocks as at 01/03/2017 were just above-average (+ 7 %), though 11 % less than in 2016, with volumes 16 % smaller in Belgium and 24 % smaller in Italy. The campaign is winding down in France. However the stock level is the same as last year in the Netherlands (- 2 %). Argentinean pear shipments via the port of San Antonio, as at 31/03/2017, were 10 % less than in 2016 and 6 % below the three-year average (across all varieties). Volumes to Russia are still good (+ 22 % on 2016), but 27 % less for Europe (- 23 % for Italy, - 33 % for the Netherlands and - 15 % for France).

Source: WAPA

Sea freight

March 2017

Given the year-on-year increase in bunker prices and no great change or improvement in charter market activity over the period, it should not be a surprise that the TCE average for the first quarter of 2017 calculates lower than the corresponding period in 2016 – for both the large and small segments.

With several vessels redelivering into the reefer pool at the start of the year as the banana majors switched into containers, it could have been worse for operators. However a strong Chilean season absorbed more contract tonnage with higher load factors – as did the squid in the South Atlantic. So while the spot market may have been relatively quiet, the reefer fleet was more optimally employed in Q1 2017 than it was in Q1 2016. And although this development generates more positives than negatives for the mode, the TCE yields on liner business were similarly lower year-on-year. Operators blame aggressive pricing from the carriers for driving down rates and therefore returns.

From now on, things become significantly more difficult. Unless demand for capacity between April and September is greater than it was last year, it is hard to forecast anything other than a long, dry, off-season. This is because while South Africa will export more oranges, the increase will be shipped in containers. Meanwhile, a stronger and longer northern hemisphere lemon season could well see a more modest shipping schedule from counter-seasonal Argentina, and at the last official count, Zespri was planning 20-or-so fewer specialized reefer voyages this season than last – this is exclusively the result of Seatrade re-constituting its New Zealand to Europe Meridian service with its own Colours Class container vessels.

On the positive side of the equation, the Algerian market re-opened to bananas at the end of March. While the quotas and licences favour the reefer mode, this in itself will clearly not be enough to absorb the availability of surplus tonnage over the next six months. It should however go some way towards lifting the burden on Mersin during the September-through-November banana surplus from Colombia and Central America.

■ El Niño Costero's time has come.

This phenomenon, caused by warming of the waters of the Eastern Pacific along the coast of South America, generated the heavy rain and floods which since January 2017 have hit northern Peru and southern Ecuador. This currently localised effect is becoming a worldwide El Niño phenomenon, because of the rising water temperature in the Central and Western Pacific.

While El Niño appears irregularly every 2 to 7 years, generally beginning in the middle of the year and lasting 6 to 18 months, it last occurred less than two years ago, during the 2015-2016 season. This phenomenon reaches maximum intensity around Christmas: dry conditions develop in Indonesia

and Australia, tropical storms and hurricanes appear further east than usual, while the Peruvian coasts see unusual precipitation, causing flooding and landslides.

During the El Niño phenomenon in 2015-2016, severe droughts hit the Caribbean zone, Colombia and Oceania in late 2015 and early 2016, followed by a period of intense rains in the Caribbean and two major cyclones: Matthew, in October 2016, caused significant damage in Jamaica, the French West Indies and Florida, while Otto, in November 2016, hit southern Nicaragua and northern Costa Rica.

Source: CIRAD



■ **Del Monte: Sweet now by air-freight.** Del Monte is expanding its Sweet pineapple range. In early May, the US multinational launched an air-freight line. The fruits are from the Thika plantation in Kenya. They are exported in specific boxes, ensuring optimum protection for the fruits bound for Europe's main airports.

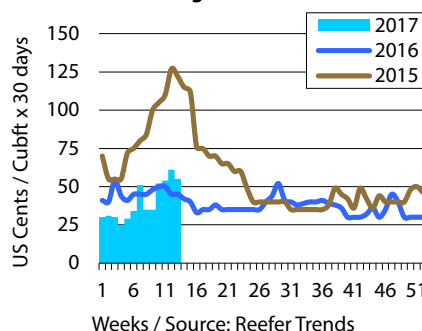
Source: Del Monte

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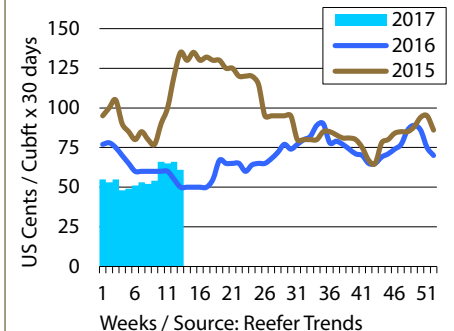
reefer trends

The independent news and information service for the reefer and reefer logistics businesses

Large reefers



Small reefers



MONTHLY SPOT AVERAGE

USD cents/cubic foot x 30 days	Large reefers	Small reefers
March 2017	46	59
March 2016	47	54
March 2015	106	101

Southern Hemisphere apples

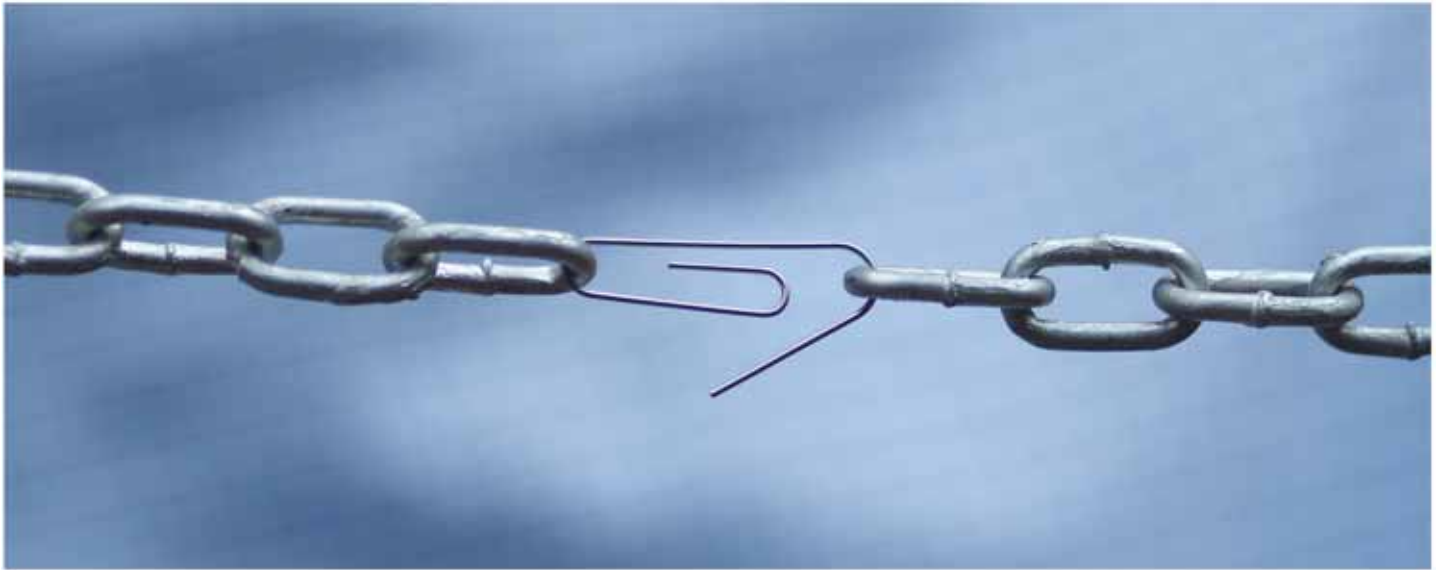
Adopting the right tactics



The harvest forecasts made by the various professional organisations report an overall increase in Southern Hemisphere production, from around + 4 % to + 10 % on 2016 depending on the sources (5.2 million tonnes according to WAPA figures). However the situations vary greatly between the origins. Argentina is encountering serious difficulties, as is Brazil though to a lesser degree. South Africa and Chile are holding up thanks to the diversification of their customer portfolio and development of their range. However New Zealand has come off best in recent years, thanks to the Asian market which has helped it expand its production, although growth is starting to slow down there too.

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Information... your weak link?



Reefer Trends is an independent news and information provider, financed exclusively by revenue from subscriptions.

First published in 2003, it provides a number of services for users along the reefer logistics chain: the Reefer Trends weekly charter market brief is *the* benchmark publication for the specialist reefer business – it tracks the charter market for reefer vessels, as well as fruit and banana production and market trends that influence charter market movement.

The weekly publication has close to 200 paying subscriber companies from 34 countries worldwide. The list of subscribers includes all the major reefer shipping companies and reefer box operators, the major charterers, reefer brokers, banana multi-nationals, the major banana exporters in Ecuador, Costa Rica, Panama and Colombia, terminal operators in the US and Europe, the world's leading shipping banks and broking houses

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Some suppliers still resurgent

The very good returns from recent years have helped New Zealand's producers continue to invest in planting modern varieties aimed at the Asian markets, among other targets. The planted surface area was reportedly up this year by 4 % from 2016, reaching 9 500 ha. Last year, production exceeded 540 000 t thanks to favourable climate conditions and despite a negative production trend, while the new orchards had not yet reached maturity. Exports followed the same trend (+ 5 % in 2016), especially thanks to the qualitative improvement in production which helped achieve a higher percentage of products meeting the export standards. Shipments to the United States increased, building on the origin's very fine performance in 2016 (48 000 t, i.e. + 52 %), and also to Taiwan (32 000 t, i.e. + 45 %). Conversely, shipments to the European market barely held up (117 000 t), and actually appear to have dropped for the Middle East (- 5 % for the United Arab Emirates) and for Asia (- 39 % for Thailand, - 11 % for India and - 8 % for Hong Kong).



South African surface areas have also expanded in recent years (24 000 ha), though growth is now less marked (+ 1 % on 2016). However, the production potential is on the increase (980 000 t, i.e. + 3 % on 2016 and + 13 % on the 3-year average), thanks to young orchards entering production and to fairly favourable climate conditions, although the origin is facing recurrent drought. Exports rose again last year (+ 3 % in 2016), given the availability, the weakness of the rand and strong demand from other African countries. However, tonnages to Europe dropped (- 8 %), though they remained close to 100 000 t, while they stagnated for Russia, the Middle East and South-East Asia.

Surface areas have been eroded in Chile, with the lowest-yielding plots converted to other crops such as the cherry. The fall should be mitigated this year (- 1 % on 2016 and - 4 % on the 3-year average). So production is struggling to exceed 1.67 million tonnes, and exports are currently below the 700 000-t threshold. Exports rose again last year to Europe (124 600 t, i.e. + 12 % on 2015) and to the United States (105 700 t, i.e. + 35 %), though without regaining previous levels. Growth is slower in the Middle East or South-East Asia, although certain countries such as Saudi Arabia and India are still exhibiting strong demand. Furthermore, shipments to neighbouring South American countries are stagnating.

Others already left sidelined

In recent years, the situation has deteriorated most of all in Brazil and Argentina, with their fruit sectors steadily losing competitiveness on the international markets since 2007. The economic situation has deteriorated year on year for producers, as production costs continued to increase and revenue decreased.

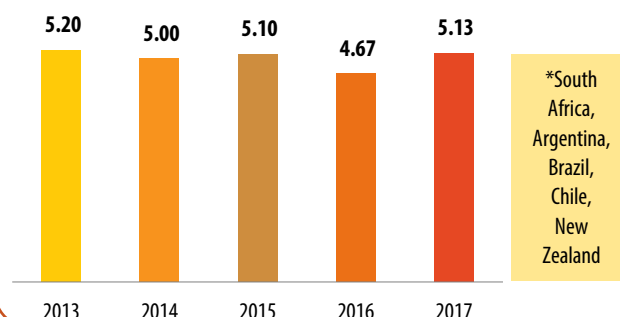
In Argentina, the rampant inflation of labour costs (20 to 30 % per year) and a relatively uncompetitive peso have weighed down on prices considerably. The fall in profitability of the sector has gradually reduced planted surface areas (21 500 ha in 2017, i.e. - 2 % on 2016), especially in the main fruit-producing region Rio Negro, as well as Neuquen and San Juan provinces. In Mendoza province, land traditionally used for apple production has been converted to the wine grape and other more profitable crops. Small producers have of course been the hardest hit, with some having to sell their plantations to bigger producers or to packers/exporters. However, if the plantations were in poor phytosanitary condition or yields were insufficient because of the lack of financial resources to apply phytosanitary treatments (approximately 30 to 40 % of all plantations were not pruned in 2016, especially for apples), the land has been bought up for real estate projects. Even the big companies are having to streamline their infrastructures. The origin is also being abandoned by foreign investors, discouraged by economic losses. Argentinean apple exports are constantly declining, reaching their lowest level in 2016 (100 000 t, i.e. - 19 % on 2015), with just 14 300 t bound for Europe (120 000 t in 2005), with the rest split between South America (Brazil, Paraguay), Russia and the United States.

In Brazil, surface areas are continuing to fall (34 000 ha, i.e. - 2 % on 2016) because of economic difficulties (lower returns and increasing production costs, European market saturated) and the severe climate conditions in recent years. Hence producers have again uprooted low-yielding old orchards to plant other crops. Similarly, exports saw a steep drop in 2016, given a production shortfall and poor sizing. They fell to 30 000 t (- 49 % on 2015), with half bound for the European market (16 700 t, i.e. - 53 %, as opposed to 122 900 t in 2003) and 30 % shipped to Bangladesh, now the no. 2 destination for Brazilian apples. Just under 10 % of tonnages were taken in by the Russian market.

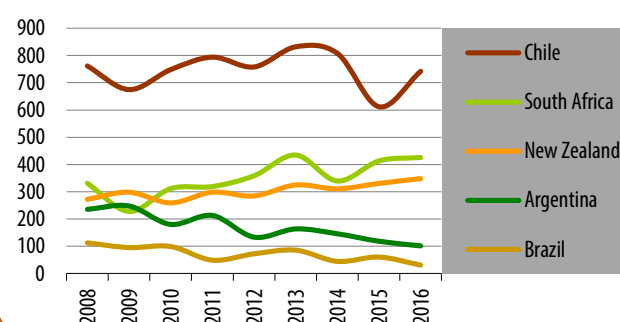
Yet in every case, they do better with a good apple!

In this competitive context, the countries that have held up best are those that made the right varietal choice at the right time, rather than those that were competitive, since this concept is too volatile. New Zealand has a particularly strong dynamic, with its planted stock still dominated by the Gala variety (30 % of tonnages). Surface areas of this variety are holding up thanks to a renewal with highly coloured clones, and a whole range of varieties has been rolled out in recent years, such as Jazz which makes up 9 % of New Zealand's stock and Cripps, making significant progress (6 %). Yet the expansion in surface areas is due above all to planting the Pacific range (11 %), especially Pacific Queen which is currently the most planted variety, along with Envy. Other varieties such as Aztec, Fuji Supreme, Kiku and Candy are gradually replacing the traditional Fuji. New cultivars such as Smitten, Plumac (Koru brand), Sweetango, Ambrosia and Kanshi are also being planted.

Apples - Southern Hemisphere
Production from main producer countries*
(in million tonnes / Source: WAPA / Processed by Infofruit)



Apples - Southern Hemisphere
Exports from main producer countries
(in 000 tonnes / Source: WAPA / Processed by Infofruit)



The South African stock is distinguished by an atypical range dominated by Golden (24 % of production), which remains the leading variety planted by producers, ahead of Granny (18 % of tonnages). There are also bicoloured apples such as Gala (16 %), Cripps Pink (10 %), Cripps Red (3 %), Fuji (9 %), Braeburn (3 %) and club varieties such as Kanzi or Jazz.

The renewal of Chilean stock in recent years has led to a gradual modification of the range, now dominated by bi-coloured apples with Gala leading the way (54 % of volumes as opposed to 30 % ten years ago) and then Cripps Pink (9 % as opposed to 4 %), while the share of Granny has fallen to 10 % and that of red apples to 14 %. The new planting involves above all clones of these bicoloured apples, with the objective of staggering the production period.

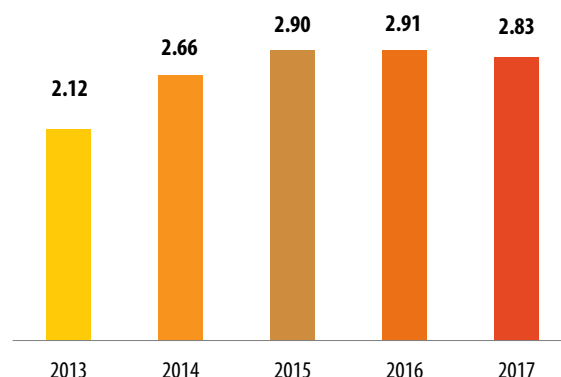
Conversely, the Argentinean stock has still seen little change, with red varieties dominating the assortment (55 % of production), far ahead of Granny (18 %) and Gala (14 %). Similarly, the Brazilian range remains focused on two emblematic varieties: Gala (55 % of production) and Fuji (40 %). The other varieties represent just 6 % of volumes, though Eva has been planted in recent years.



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Apples - European Union Stock in main countries at 1st March

(in million tonnes / Source: WAPA, professional organizations /
Processed by Infofruit)



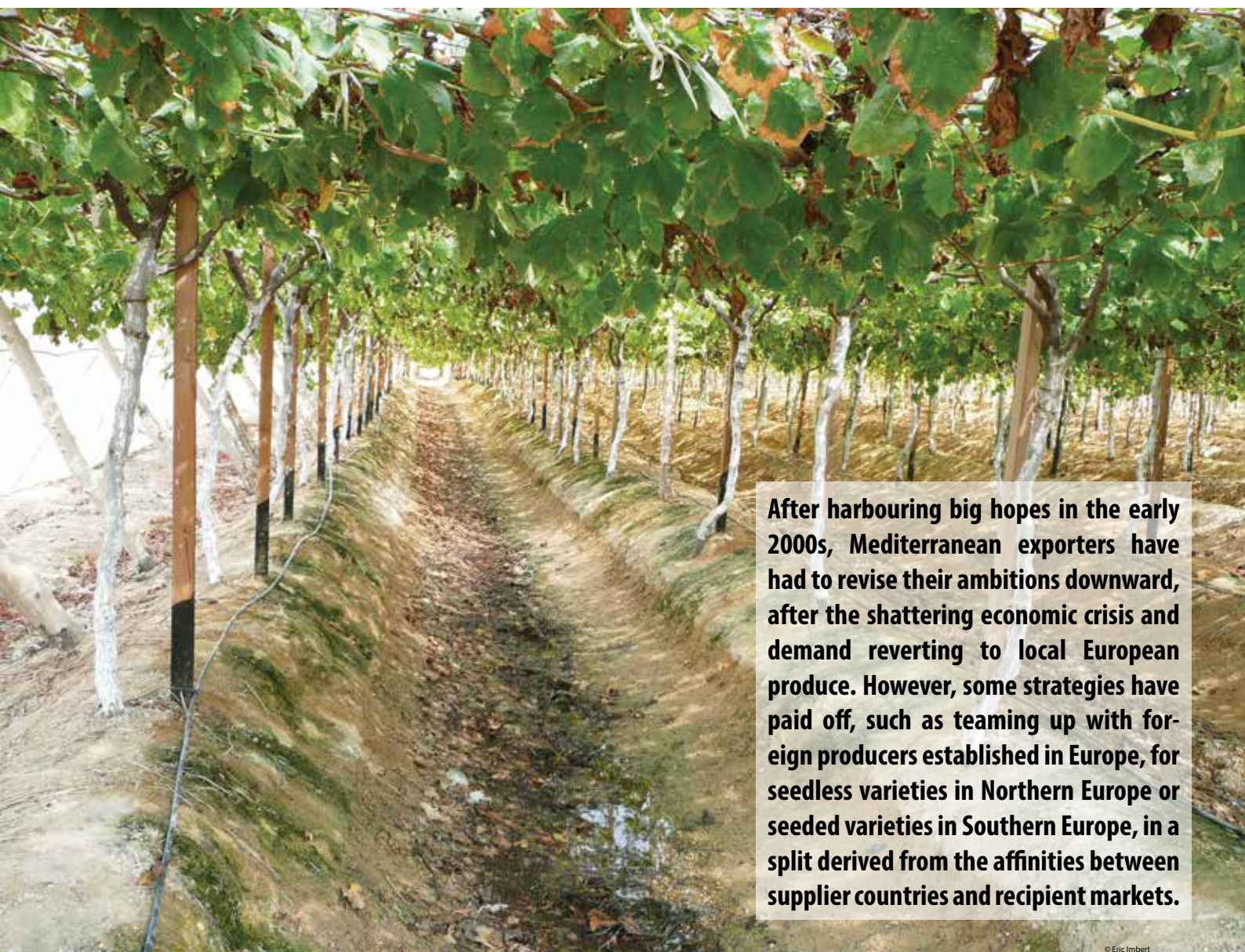
Hope for a slight recovery in 2017

The prospects for the 2017 campaign are a bit brighter than in previous years, with the Europe-wide stock of apples as at 01/03/2017 slightly smaller than last year (2.83 million tonnes, i.e. - 3 % on 2016) and a good production potential for most of the Southern Hemisphere origins, including for Brazil which should return to production. We should also note that the European market seems to have healed, after the steep fall in recent years (- 4 % on 2015, as opposed to - 15 to - 20 % in previous years). However, while the first volumes arrived in Europe in late March, the start of the trading campaign could see a bit of a slow start, like last year when the market only really switched to the Southern Hemisphere origins from mid-May. Similarly, the switch was late last year for Granny, with interest only picking up from June. Conversely, the Pink Lady campaign is for the moment still beginning at around the same period, with the European campaign ending in mid-May. Hence New Zealand's exporters hope to be able to increase their shipments, with a harvest up by 6 % from 2016 (572 000 t), though an outlet still needs to be found. South African exports could rise by 2 to 4 % in 2017, depending on the sources, to reach around 435 000 t. Chilean producers are anticipating a fine harvest (1 675 000 t, i.e. + 2 % on 2016), yet uncertainty remains regarding the level of shipments (between 659 000 t and 750 000 t, depending on the sources). Argentinean exports should remain hard hit by the economic difficulties, and at best climb by 2 %, or even by up to 10 % depending on the sources, i.e. between 100 000 and 110 000 t. Brazilian producers are hoping to be able to regain their 2015 level, i.e. approximately 60 000 t ■

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Inter-season grape

More difficult than predicted



After harbouring big hopes in the early 2000s, Mediterranean exporters have had to revise their ambitions downward, after the shattering economic crisis and demand reverting to local European produce. However, some strategies have paid off, such as teaming up with foreign producers established in Europe, for seedless varieties in Northern Europe or seeded varieties in Southern Europe, in a split derived from the affinities between supplier countries and recipient markets.

© Eric Imbert

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Table grapes – EU – Imports from Mediterranean Basin by destination in 2016

in tonnes	Egypt	Morocco	Israel
Northern Europe			
United Kingdom	23 623	981	2
Netherlands	18 572	515	471
Germany	4 370	0	303
Eastern Europe			
Slovenia	4 950	0	713
Southern Europe			
Spain	159	3 371	0
France	133	1 917	102
Italy	3 445	0	0
Total	56 505	7 089	1 318

Source: Eurostat

**Table grapes – EU
Imports from Mediterranean Basin**

in tonnes	2000	2005	2010	2015
Egypt	3 574	24 143	43 424	48 679
Israel	6 720	7 825	3 937	1 130
Morocco	1 007	8 137	9 211	7 593
Total	11 301	40 105	56 572	57 402

Source: Eurostat

Just a slice of the cake and a few crumbs

In the early 2000s, the planting of modern varieties in the Mediterranean, especially seedless ones such as Sugraone, generated hopes of a recovery or even growth in exports from the three main supplier countries - Egypt, Morocco and Israel - in the inter-season niche, i.e. between the end of Southern Hemisphere production and the beginning of European production. After a brief honeymoon when imports from these countries to Europe practically doubled in five years to reach nearly 60 000 t at the end of the decade, the dynamic has faded, leading to a slowdown and stagnation of shipments. This is due to a combination of internal and external economic and political factors. Production has been hampered by increasing costs of inputs and labour in Israel, and to a lesser degree in Morocco, and by the Arab spring in Egypt. The external factors include the increasingly marked competition from Spanish production, mainly from the Murcia zone extending its production calendar, where seedless varieties represent nearly 70 % of surface areas. Italian production is not to be outdone, with planting rapidly increasing in Puglia for seedless varieties (> 20 %). However if we look more closely, Israel and Morocco have suffered most of all, since European market share was divided up according to historic partnerships. Hence Egypt is firmly established on the non-producing North European markets, especially the United Kingdom, while Morocco has its main presence in Southern Europe where local production is released earlier and earlier. Israel has only really maintained its market shares in Eastern Europe, where grape imports do not amount to much.

Egypt plays its cards right

After a short hiatus attributable to the political crisis, the dynamic embarked on by Egyptian producers (from less than 1 000 t of exports in 1998 up to 115 000 t in 2015) still seems to be bearing fruit and even recovering, with the origin last year registering its best performance on the European market (56 000 t, i.e. + 15 % on the 3-year average). This can be explained both by its positioning on the North European markets and by the strategic choices made by Egyptian exporters to cultivate partnerships with foreign investors. This applies in particular to South African operators established on the European market, who are seeking to extend their campaign, as well as to Europeans aiming for an early-season presence, especially in Italy. Indeed the campaign starts with perfect timing for these operators: late April for open-field production in Upper Egypt, and polytunnel production in the north of the country, and in May for open-field production. The calendar could be earlier still, since while traditional production was mainly based in the centre of the Nile Delta, it has since extended westwards between Cairo and Alexandria, and in the eastern part of the Delta (Ismailia

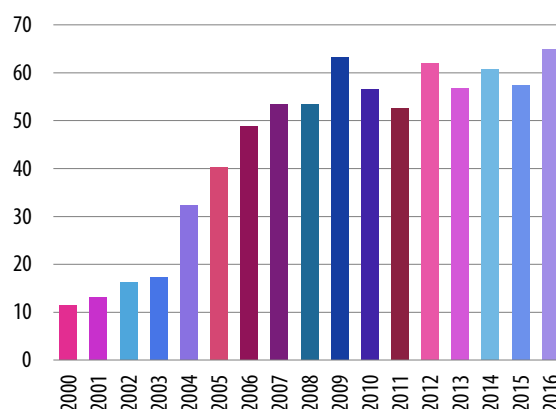
and Belbais), and is now drifting southward. It is continuing to extend in this direction with the Nile Valley major irrigation projects (Luxor and Assouan), but also toward the Toshka zone where major projects are underway. Year on year, the varietal range has been enriched with modern varieties, mainly seedless. Hence although the origin was initially known for its traditional Sultana/Thompson Seedless production, it has stepped up planting of white grape varieties such as Sugraone/Superior Seedless, topped up by Early Sweet and Perlette for the early niche, the red varieties Flame and Crimson Seedless, but also the seeded varieties Victoria or Red Globe. The European Union represents a major outlet for this produce, taking in just over 40 % of tonnages. The majority is however aimed at the main North European markets, such as the United Kingdom (approximately 40 % of imports into Europe) and the Netherlands (36 %), which forward the supply to other North European countries. The remaining volumes are divided mainly between Russia, Saudi Arabia and South-East Asia.

Morocco switching from North to South

Although Egypt has clearly taken the ascendancy on the North European markets, Morocco is also a major inter-season player, especially on the South European markets. However, after reaching 12 000 t in 2009, Moroccan exports have ebbed, stabilising at around 7 000 to 8 000 t since 2010. However, production has also increased through planting modern varieties, especially seedless ones such as Sugraone or Flame Seedless, aimed at the North European markets. The United Kingdom, previously one of the main target outlets, is now just the no.3 destination for the Moroccan grape with 1 000 t imported in 2016, under combined pressure from Egypt and Spain. Paradoxically, shipments to Spain have grown steadily, reaching more than 3 000 t/year. Market shares have also crumbled on the French market due to Italian competition, though Moroccan exports to France did still amount to nearly 2 000 t in 2016.

Export production is based in the foothills of the Atlas Mountains, extending from Beni Mellal to Agadir. The vast majority of production is based around Marrakech (90 %). It involves in particular twenty or so producers, most within Aspert (Association of Table Grape Producers & Exporters), which have mainly developed seedless varieties. Some more traditional facilities have joined up to ARM (Moroccan Grape Association) to obtain their EurepGap certification and find alternative outlets to the saturated domestic market. Yet unlike the exporters group above, mainly focused on Northern Europe, they have instead targeted Southern Europe, based on the observation that they grow varieties suited to these markets (Prima, Italia, Muscat, Cardinal or Victoria), aimed at the early slot (May and June), thus topping up European production of these varieties.

**Table grapes - European Union
Imports from Mediterranean Basin**
(in 000 tonnes / Source: Eurostat)



And Israel falling back to the East

The efforts made by Israeli producers in the early 2000s to revitalise exports by planting modern varieties do not seem to have borne fruit. Planting mainly involved seedless white varieties such as Superior Seedless, Thompson Seedless, Early and Prime Seedless, topped up with some Red Globe, aimed mainly at the British market. Yet after peaking at 11 000 t in 2006, exports have fallen steadily down to just 2 000 t in 2016. Half of these volumes are shipped to the European market (1 000 to 1 300 t in recent years, as opposed to 7 000 t in 2005), with Eastern Europe taking the majority (700 t for Slovenia in 2016), and the remainder divided between the Netherlands (470 t) and France (100 t). The campaign begins fairly late, in mid-May, with covered production, and is hampered by the high costs of treatment products and labour. The table grape planted area extends from Eilat in the south to the Golan Heights in the north. The bulk of production is based in the Lachis zone, and in the Jordan Valley. There are also vineyards in the Gezer region and in Beer Tuvia ■

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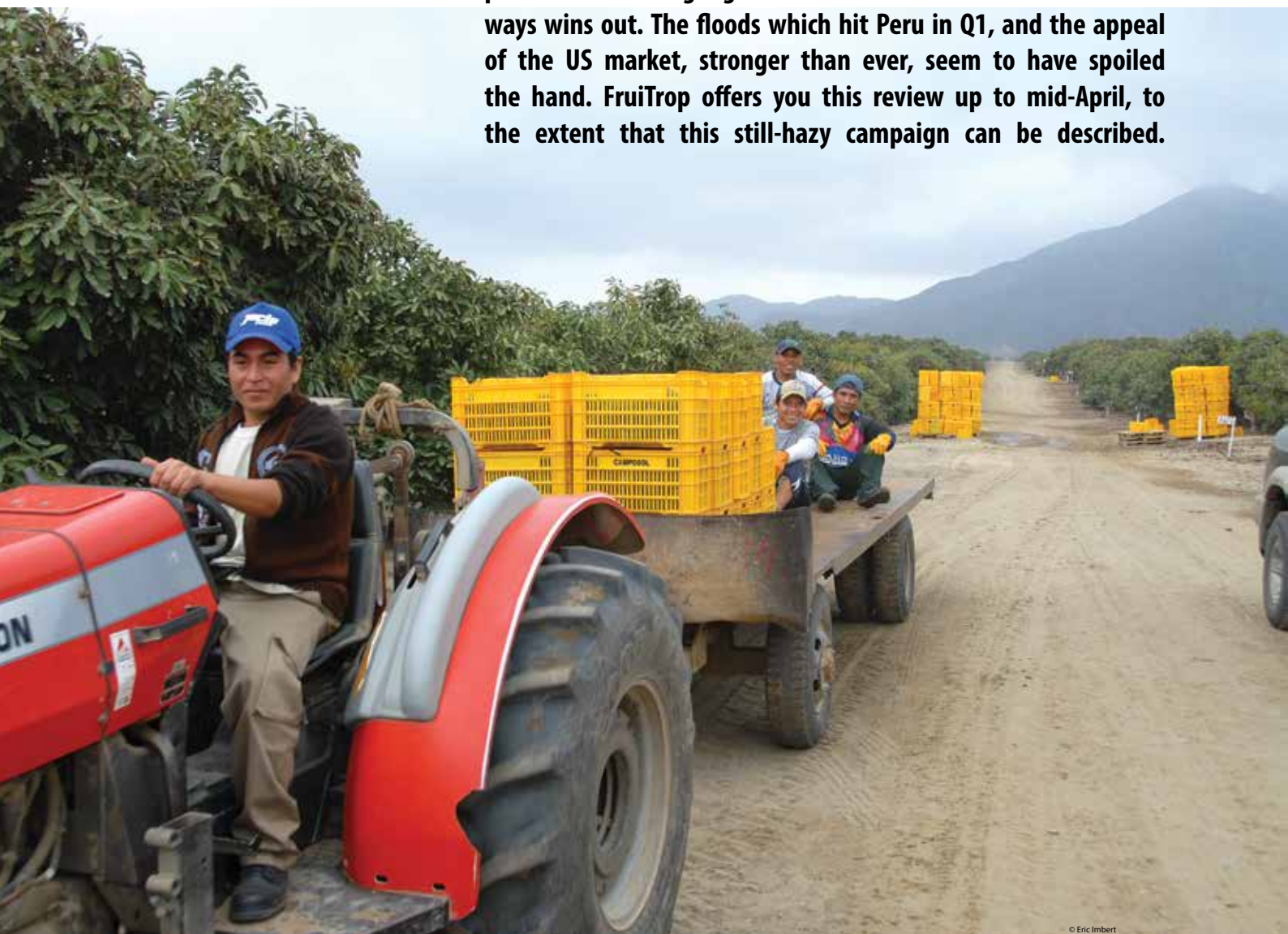


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Counter-season avocado in Europe

In the Peruvian mists

2017 was set to be a test campaign on the European summer avocado market, if not a crash test. The magnitude of incoming Peruvian shipments would finally fill a structurally under-supplied market and gauge the real demand level. Yet nature always wins out. The floods which hit Peru in Q1, and the appeal of the US market, stronger than ever, seem to have spoiled the hand. FruiTrop offers you this review up to mid-April, to the extent that this still-hazy campaign can be described.



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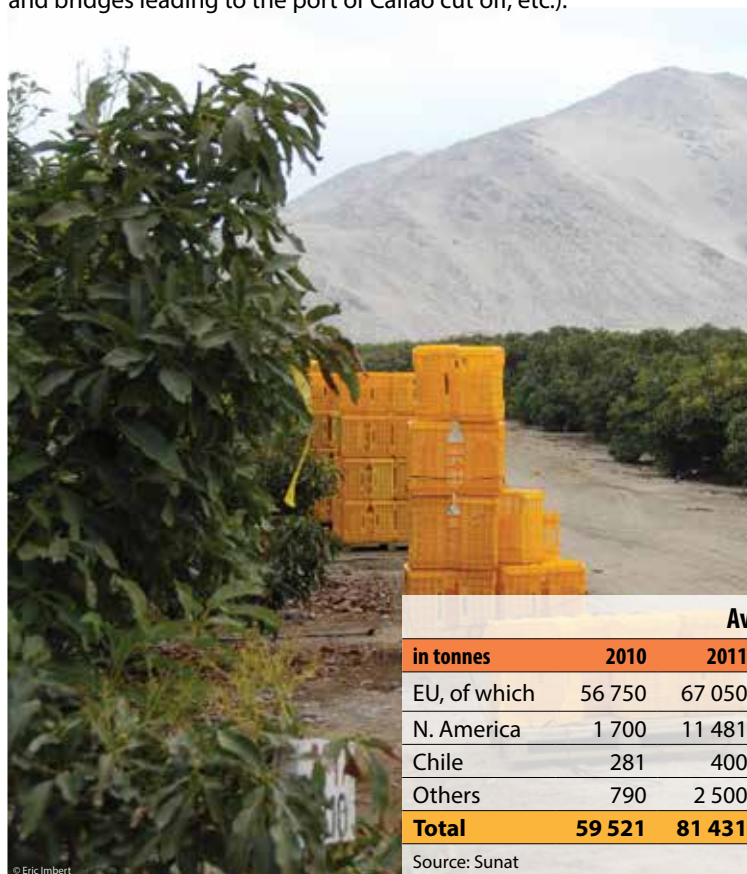
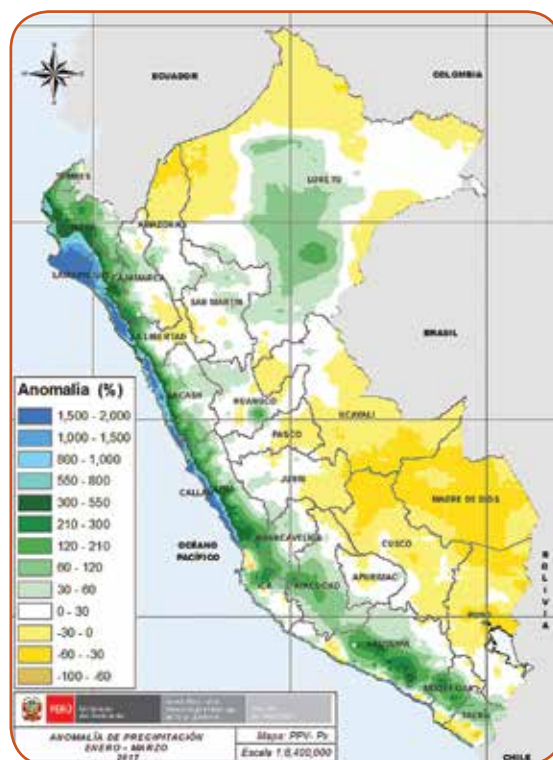
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Peru

Another meteorological blow

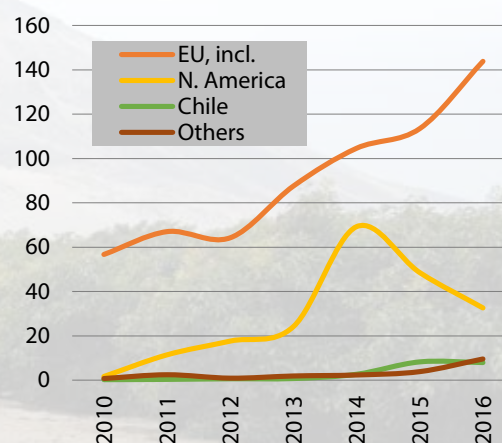
Peru has truly found a losing formula. For the third consecutive year, unfavourable weather should curb growth in production, despite the surge in cultivated surface areas. The fault this season lies with an El Niño Costero phenomenon that might be described, somewhat exaggeratedly, as an El Niño phenomenon geographically concentrated over the Andean region, and producing the same effects, i.e. real deluges; a paradox on this Peruvian coastal strip characterised by a practically desert climate. The far north of the country was particularly hard hit (Piura, Tumbes). However, the rains also reached an exceptional level (10 to 20 greater than normal, according to the Peruvian meteorological services – see map) in major northern production zones, such as the Chavimochic irrigated area (300 mm in the coastal zone of La Libertad Department), and above all the more recently developed area of Olmos (700 mm in Lambayeque Department). These had multiple impacts. Direct losses, still difficult to evaluate at the time of writing, seem relatively limited (10 to 15 % according to certain professionals). The sandy soils are well-drained and the avocado is a sturdy fruit. On this basis, exportable volumes of Hass could be around 215 000 to 220 000 t, and so would still be approximately 20 % more than last season. Conversely, the campaign calendar has been considerably delayed. Firstly, the cloud cover slowed growth and maturation. Secondly, the harvesting and logistics continued to pose problems in early April (flooded orchards, roads and bridges leading to the port of Callao cut off, etc.).

Peru – Rainfall anomalies from January to March 2017



Avocado - Peru - Exports by destination

(in 000 tonnes / source: Sunat)



Avocado – Peru – Exports

in tonnes	2010	2011	2012	2013	2014	2015	2016
EU, of which	56 750	67 050	64 270	87 609	104 650	113 514	143 852
N. America	1 700	11 481	17 675	24 209	69 289	48 568	32 636
Chile	281	400	678	785	2 717	8 294	7 992
Others	790	2 500	953	1 941	2 388	3 901	9 618
Total	59 521	81 431	83 576	114 544	179 044	174 277	194 098

Source: Sunat

Avocado at its best

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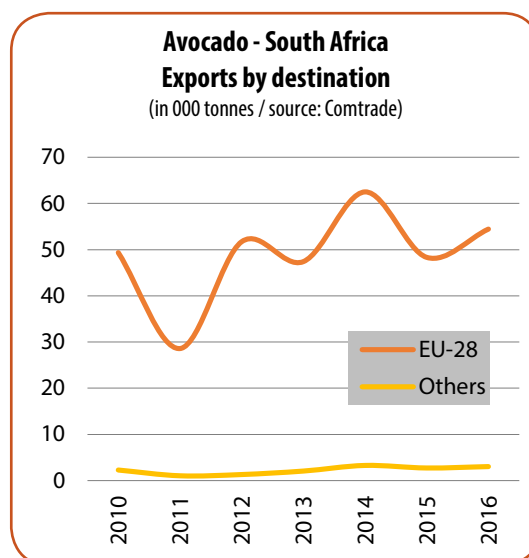
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South Africa

Off year, though exports appealing

Unlike Peru, South Africa enjoyed satisfactory climate conditions, after a 2016 marked by drought and by heavy hail storms. The strong winds which hit the Tzaneen zone in January remained highly localised. Nonetheless, the harvest is set to be smaller than in 2016 (- 15 to - 20 % according to the various professionals), because of the adverse alternate bearing effect and the after-effects of the drought (flowering limited by water stress). In this context of moderate volumes, Europe should prevail over the local market, though demand is stronger every year and increasingly interested in Hass. Hence the production fall will be passed on only in part to exports, with the programme down by "a mere" approximately 7.5 % (50 000 t, i.e. 12.5 million boxes). The fall should relate primarily to the green varieties. The fruit sizing is set to be good.



Avocado – South Africa – Exports

in tonnes	2010	2011	2012	2013	2014	2015	2016
EU-28	49 351	28 582	51 713	47 404	62 499	48 325	54 448
Africa	1 217	57	150	656	765	908	924
Middle East + Mediterranean	627	253	308	362	610	444	898
Asia	430	488	588	486	548	313	502
Russia	-	-	-	534	1 344	950	701
World	51 631	29 614	53 016	49 460	65 772	51 046	57 473

Source: Comtrade



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Kenya

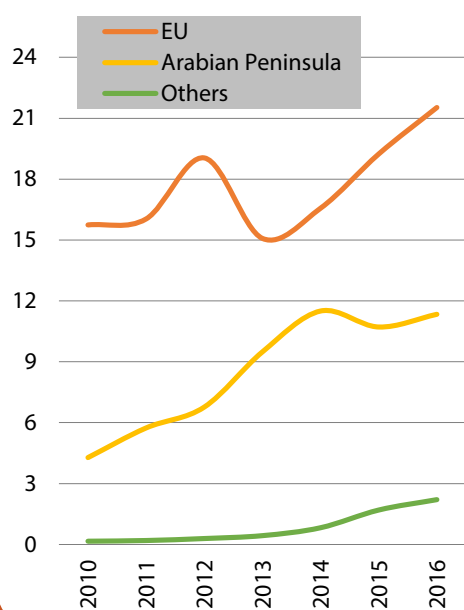
An extraordinary drought

The overall panorama is still difficult to perceive for this origin where 70 % of production reportedly relies on small or very small producers. However, it seems that after several seasons of steady rises, Kenyan exports should barely change in 2017. The drought, even more intense than in other years, has affected production for players without irrigation, in terms of both volumes and sizing. Conversely, the logistics seem to be a less limiting aspect. According to certain professionals, actual transport times are tending to shorten (for MSC in particular, thanks to transshipments in Port Abdullah), while the shipping cost has fallen considerably with all charterers, although it remains very high.



© Régis Domergue

Avocado - Kenya - Exports by destination
(in 000 tonnes / sources: Customs, HCDA)



© Régis Domergue

Avocado – Kenya – Exports

in tonnes	2010	2011	2012	2013	2014	2015	2016
EU-28	15 743	16 039	19 045	15 079	16 568	19 238	21 529
Arab. Peninsula	4 280	5 741	6 769	9 489	11 502	10 714	11 340
Others	160	194	292	434	824	1 696	2 208
Total	20 183	21 974	26 106	25 002	28 894	31 648	35 077

Sources: Customs, HCDA

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Tanzania

Young stock coming into its prime

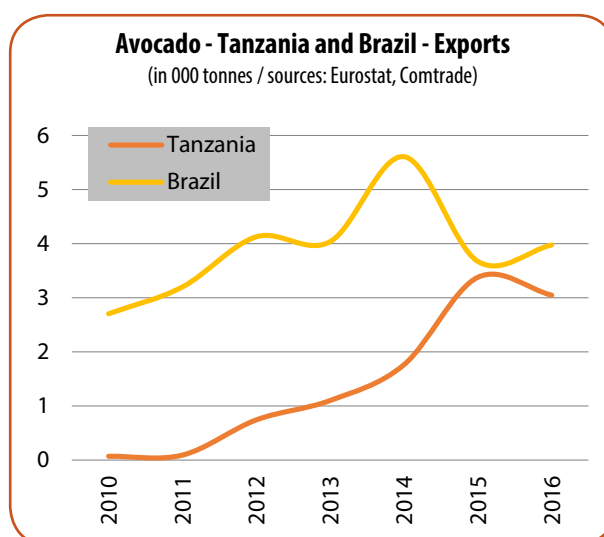
The outsiders will be the only ones to see a really significant rise in export potential this season. However, available volumes will remain limited (less than 10 000 t across all origins). The Tanzanian harvest is set for a distinct rise, after an adverse alternate bearing effect in 2016. The young Hass cultivated area, estimated at 1 300 ha, is continuing to come into its prime and expand, in both the Mount Rungwe area (south) and the Siha area (north). The export potential should be around 5 000 t, as opposed to approximately 3 000 t in 2016. Despite an intense drought, sizing is set for a very good level thanks to the youth of the stock and the investments made in terms of irrigation.



Brazil

A really fine harvest!

Capricious weather can sometimes be synonymous with a bumper harvest. An abnormally cool winter in the Sao Paulo region, plus frost in June, caused intense flowering and so a really fine harvest. Hence despite a local market increasingly interested in Hass (with McDonalds even launching "avo-burgers" there recently!), the export potential should approach 6 000 t, as opposed to less than 4 000 t in 2016. On the flip side, the sizing will be toward the low end, with 20/22 in the majority. The campaign calendar could be a little more concentrated than usual, because of abnormally high humidity.



Mozambique

A new player

The baptism of a new source does not occur all that often. In 2017, Mozambique will export its first Hass avocados aimed at the Community market (400 t programme according to the press). Westfalia, the world's leading player in the sector, is behind this project. According to the initial information gathered, the area planted amounts to approximately 150 ha of Hass and Carmen Hass, located in the south-west of the country (Manica province, close to the border with Zimbabwe). The combination of the climate and the Carmen variety should see the export season begin in January, making an excellent complement to the South African campaign. A second wave of planting is under study, according to the national press.

Avocado – Tanzania – Exports

in tonnes	2010	2011	2012	2013	2014	2015	2016
EU-28	21	6	133	968	1 643	3 278	2 948
Others	49	86	610	133	120	100	100
Total	70	92	743	1 101	1 763	3 378	3 048

Sources: Eurostat, Comtrade

Avocado – Brazil – Exports

in tonnes	2010	2011	2012	2013	2014	2015	2016
EU-28	2 665	3 006	3 959	3 928	5 265	3 535	3 908
Others	39	194	168	109	343	136	68
Total	2 704	3 200	4 127	4 037	5 608	3 671	3 976

Sources: Eurostat, Comtrade



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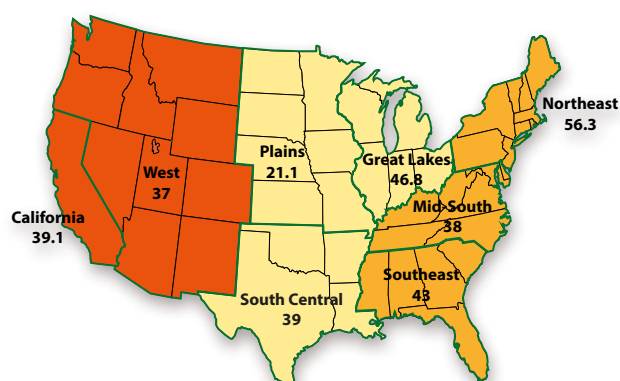
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USA - Population by main regions

USA total: 321 million

(in million inhabitants / source: US Census Bureau)



Uncle Sam as arbiter of the peace

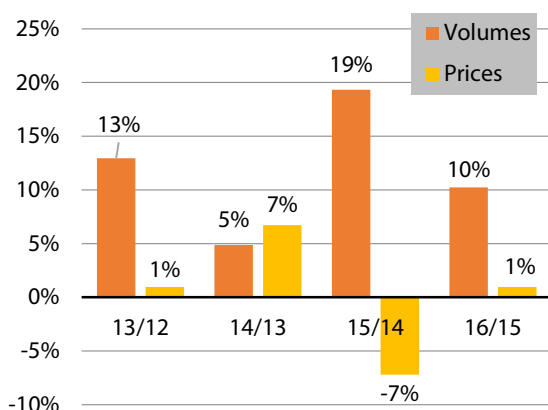
While the cumulative export potential of the suppliers to Europe seems to be greater than in 2016, what about the division of these volumes between the world's two main markets? It has to be recognised that the pulling power of the US market seems stronger than ever. Our price indicator was above 50 USD per 11.14-kg box in early April, an unprecedented level for this time of year, and actually considerably higher than the rates charged at this time in the EU, themselves at record levels (nearly 17 euros per 4-kg box, as opposed to just over 15 on the Old Continent), not to mention the freight price difference.

Appetite for Hass undiminished on the other side of the Pond

It is a good bet that prices will continue to soar on the other side of the Pond, for reasons relating both to supply and demand. The 2016 figures show that the US consumption growth dynamic is not flagging. Despite a second half marked by a shortage of Mexican fruit, the market was up by approximately 10 %, with prices maintaining a similar level to last season. Even the super-consuming regions of the American West continued to exhibit an incredible dynamic (up by between 6 and 14 % depending on the zones). There is no magic formula, just the result of the promotion approach, as powerful as it is well oiled, orchestrated by the HAB and backed up by millions of dollars (a budget of 56 million USD for 2016, to be precise).

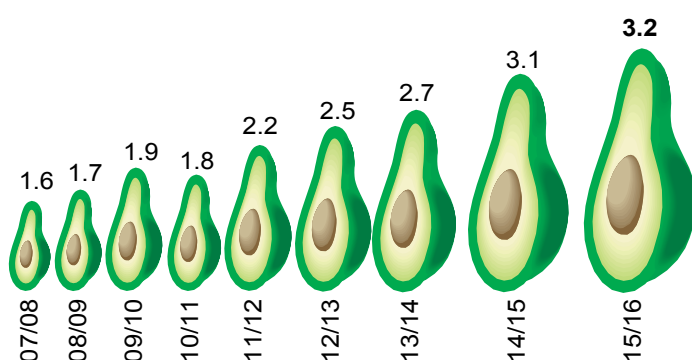
Avocado - United States Evolution of consumption and import prices

(calendar year / source: HAB)



Avocado - USA - Consumption kg per capita

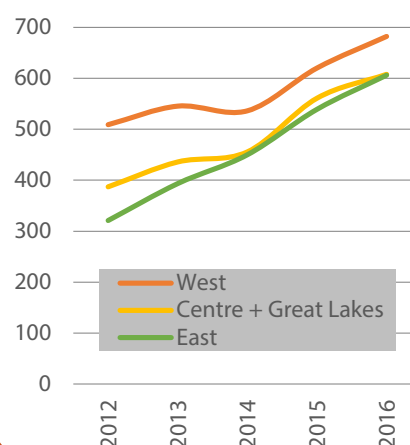
From November to October



Sources: CAC, US customs

Avocado - United States Consumption by main regions

(in million pieces / source: HAB)



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Mexico

Smaller production, with plenty of speculation?

The supply available to feed the US summer market is another factor pointing to prices remaining high this season. The market's main suppliers are both in shortfall, starting with Mexico which still accounts for between 55 and 65 % of the supply to the United States between May and June. Michoacán, even with its massive 150 000 ha of orchards, did not escape the natural alternate bearing phenomenon in 2016-17. Furthermore, it would seem that the compensatory role played by the entry of newly approved surface areas into the export programme to the United States has been less significant. Despite the growth in surface areas, eligible orchards appear harder to find (approximately 110 000 ha of the State's 150 000 ha already included in the programme). Hence the 2016-17 campaign should be marked by an unprecedented fall in Mexican exports to the United States, as would seem to be indicated by the 15 % fall from the previous season in cumulative exports by the end of March. What about the volumes still available? While all the professionals agree that volumes are smaller than in 2016, the extent of the shortfall is still unclear. Many operators lament the degree of speculation in the industry, culminating in a halt of more than ten days last October. This episode made a lasting impression, seriously tarnishing the brand image of Mexico for many US importers, left unable to cover their commitments with the supermarket sector. In any event, shipments should fall considerably after the wave of promotions for the 5 of May holiday, before becoming very limited in June.

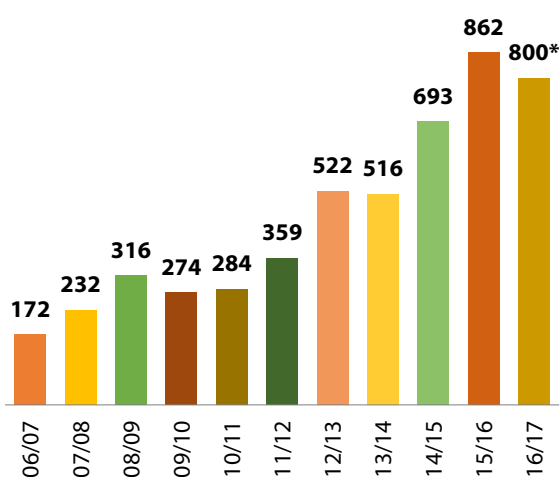


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Avocado - Mexico - Exports to the USA

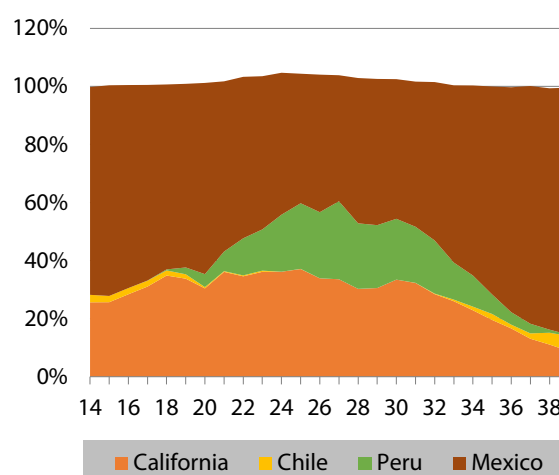
(in 000 tonnes / source: Mexican Customs)

* estimate



Avocado - USA - Weekly supply by sources from April to September - 2013-2016 average

(source: HAB)



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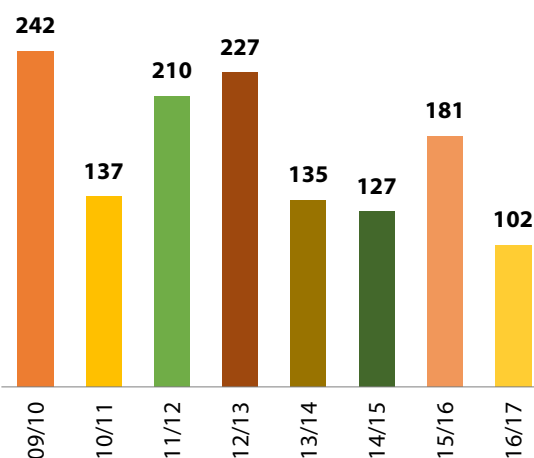

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California

Dried up

Is the yoyo a Californian speciality? We were just wondering given the huge difference between the very small harvest expected this season and the very big volumes from the previous campaign (barely more than 100 000 t in 2017, as opposed to more than 180 000 t in 2016). This extremely marked alternate bearing effect, though usual for this region, is due to a heatwave in spring 2016 which hit flowering hard. The trading calendar is currently ahead of the forecasts, with the US market particularly appealing and sizing boosted by the long awaited massive rainy period at the beginning of the year. Hence the shortfall, big throughout the season, could be more marked in the second half of the campaign, with the CAC's projections actually reckoning on volumes waning from late July.

Avocado - California - Production
(in 000 tonnes / source: CAC)

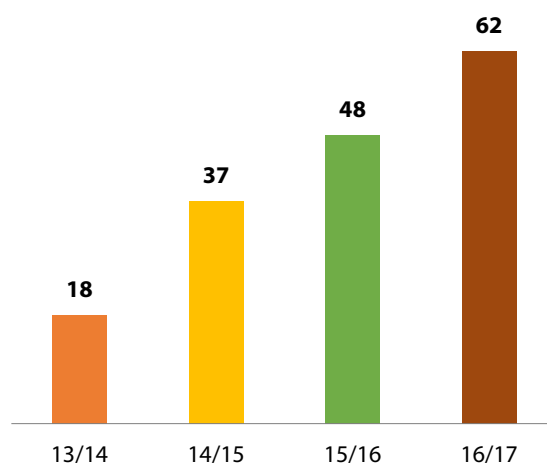


Jalisco

In not such good trim...

Will Jalisco be able to reduce the shortfall in the supply to the US market in the coming months? Perhaps: access to the giant neighbouring market now seems imminent, and more subject to political than technical factors (first shipment blocked at the last minute in January, probably in retaliation to Mexico's ban on US potatoes). Nonetheless, the volumes involved will not be enough to rein back the prices. Only 12 000 ha of the State's 17 000 Hass cultivated area are in zones free from quarantine diseases. Furthermore, not all these avocado orchards have been approved. The volumes involved for the whole campaign vary depending on the sources, from 13 000 t (USDA projection from June 2016, which reckoned on approximately 1 300 ha of orchards being ready to export) to 50 000-60 000 t (estimates by certain professionals based instead on 6 000 ha).

Avocado - Jalisco (Mexico) - Exports
(in 000 tonnes / source: APEAJAL)



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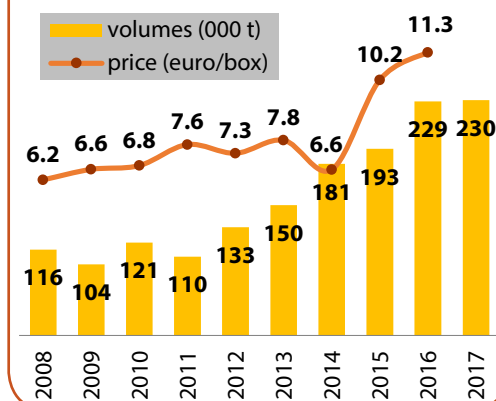
Smaller Peruvian volumes than expected to Europe and a similar overall supply to 2016?

This extremely promising context could attract bigger Peruvian volumes than expected to the United States, especially since Peruvian exporters and US importers could be keener than usual to work together, though for different reasons. On the downstream side, having an alternative to Mexico, even in part, seems to have become a strategic avenue for reasons relating to the origin's reliability mentioned above. On the upstream side, shipping to a market situated just ten days or so away by sea would certainly be a safer option than the 17-25 day voyage to Europe, if the fruits have been weakened by extreme weather. Hence although the outline of this campaign is still fairly unclear, it is evident we might question the initial projection for Peruvian exports to Europe, predicting a steep rise of more than 20 %. Taking into account the production losses and the appeal of the US market, can we imagine that ultimately shipments to the EU-28 will be fairly similar to last year? Perhaps: in which case the supply to the European market across all origins should not be so different from 2016, while demand has risen again, with growth rate in double figures, during this winter campaign (approximately 15 to 20 % – see winter review).



© Guy Böhner

Avocado - EU-28 - Supply and average import price during summer season
(sources: Customs, CIRAD)



Toward high prices, if the danger period of June is successfully negotiated

If this prospect comes true — reiterating once more that the situation in Peru is still hazy — prices should maintain a very good level during this counter-season campaign currently starting. Nonetheless there are still some dangers to avoid. The period of steeply rising Peruvian shipments, which should come in June rather than late May this season, will more than ever be a risky time. The exceptional opening of the European market could cause a massive influx of fruits as soon as the logistics get up and running again. Furthermore, will the dry matter content (still low at present) and the shelf life of the incoming fruits be beyond reproach? The issue of post-harvest too will be a major challenge throughout this season, in particular in a country where operators are unused to treating fruits that have undergone periods of high humidity. So the upstream segment will need to apply plenty of rigour, in managing both the fruits and the volumes. Finally demand, quietened by retail prices never previously reached, will need to be revitalised.

Avocado – Southern Hemisphere Exports to EU-28

in tonnes	2016	2017 trend
Peru	144 367	=
Southern Africa	54 095	↘ 10 %
Kenya	23 444	= ↘
Brazil	3 908	↗ 50 %
Tanzania	2 948	↗ 60 %
Total	228 761	=

Sources: Customs, CIRAD

Avocado – Southern Hemisphere – Exports by source

in tonnes	2009	2010	2011	2012	2013	2014	2015	2016
Peru	45 661	56 345	66 155	62 618	86 260	101 971	114 321	144 367
Southern Africa*	38 821	47 800	27 375	49 083	45 165	56 713	50 962	54 095
Kenya	15 038	14 123	15 028	17 078	13 313	15 604	20 728	23 444
Brazil	2 797	2 665	3 006	3 959	3 928	5 265	3 535	3 908
Tanzania	6	21	6	133	968	1 643	3 278	2 948
Others	353	113	79	306	300	447	497	337
Argentina	1 984	-	372	114	158	43	78	133
Total	104 659	121 067	112 021	133 291	150 092	181 686	193 399	229 231

*South Africa + Zimbabwe + Swaziland / Sources: Customs, CIRAD

Two halves of an avocado are shown. The half on the left is cut lengthwise, revealing a large, dark brown pit. The half on the right is cut crosswise, showing the smooth, light green flesh. Both halves are resting on a dark, textured surface. The background is a blurred green, suggesting foliage.

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Sizing, the other major challenge for this campaign

While the supply level seems readily manageable, assuming the absence of major hiccups, what about the breakdown by size? The US market craves large fruits, which are abundant in the “small” Californian supply, but much scarcer than usual in the Mexican supply, which still represents the bulk of the market supply in Q2. According to professional sources, most of the Mexican supply yet to be sold in early April comprised size 20 fruits and above (as opposed to 20 % size 14 and 30 % size 16/18), for which the prices charged in the United States are much lower (approximately 50 USD in mid-April for 40/48, but barely more than 40 USD for 60 and 35 to 40 USD for 70). In this context should we not be wary of a larger proportion of small fruits than usual in the Peruvian supply bound for the EU-28, especially since production from the northernmost zones, exporting for the first time this season, seems to match this type of profile? This is a point that bears watching, in particular when a large proportion of the Kenyan supply, whose position depends on its price competitiveness, appears to be small-sized.



© Guy Böhmer



Promotion still a strategic challenge

The rather optimistic prospects for this campaign, difficult though it will be to manage, must not overshadow the medium-term prospects. The production growth of the countries feeding the counter-season market, already very high, is tending to gather pace. The figures are climbing ever higher in Peru, where the cultivation area, already 25 000 ha strong, is continuing to expand at a frenetic rate. ProHass is reckoning on 35 000 ha of avocado orchards in 2021, i.e. an export potential 2 to 3 times greater than the current 200 000 t; and this is with highly conservative assumptions. True, the export window is tending to expand, with in particular the large-scale plantations set up in the early zones, though volumes are nonetheless enormous. Similarly, South Africa is gathering pace with a planting rate closer to 1 000 ha per year at present than to the 500 ha in previous years, thanks in particular to investments made by major nurseries to increase their production capacity. There too, it is the zones or varieties able to extend the trading calendar which are being targeted. The situation is more difficult to perceive in Kenya, yet the potential is there and the cultivation area also seems to be progressing (between 500 and 1 000 ha per year, depending on the sources). Finally, the outsiders are not to be outdone. Brazil should plant between 400 and 500 ha of Hass in 2017, while the Tanzanian cultivation area is also expanding between the two traditional players, and another project is under consideration. Finally, Mozambique is getting started. True, there is major potential on the world market, but is Peru not setting too high a tempo? The test will come perhaps in 2018, when the Mexican supply to the US and the Peruvian production level are set to be on a different level ■

Eric Imbert, CIRAD
eric.imbert@cirad.fr



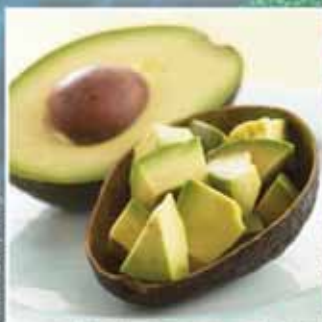
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Initial review of the 2016-17 winter avocado season: 20 out of 20!

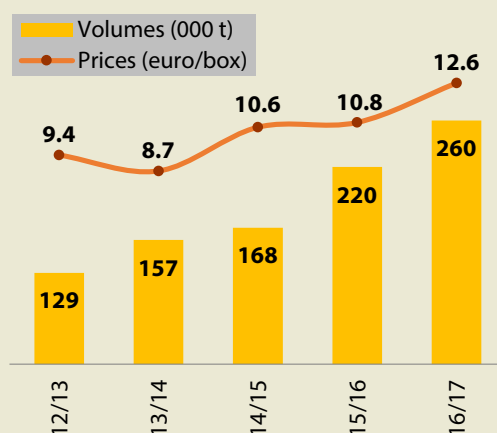
Analysis drawn up based on professional figures, to be confirmed by Customs data.

Growth of approximately 20 %: and no, we are not talking about the market for the latest generation iPhone, but for the avocado! This performance, following on from the 30 % registered between the 2014-15 and 2015-16 seasons, was combined with a parallel increase in Hass prices, also of more than 20 %. This is symptomatic of the extreme market tension despite additional volumes which were in no way trifling. At no time did the market show any weakness, as is indicated by the great steadiness of the prices, for the first time throughout the campaign keeping to within a very narrow range of nearly 12 to 14 euros, before soaring into the heavens from late March (according to our average indicator, calculated based on the size 18). It was the traditional suppliers who primarily fuelled this growth. Despite more marked interest from US importers and the ongoing growth in shipments to diversification markets, Chile recorded its biggest European campaign, consolidating its number one position with imports approaching 90 000 t. Similarly, Israel and Spain both shipped record volumes to the EU, an atypically late calendar enabling them to take advantage of an exceptionally open market at the end of the season. Colombia, the newest supplier country to the Community market, also played its part, with shipments which should more than double from 2015-16 (last volumes expected in June). Conversely, the first are sometimes the last. Mexico, which recorded the best performance last season, nearly quadrupling its shipments to Europe, was the only origin to see a downturn, and a very considerable one at that, due to a production shortage.



Avocado - EU-28 - Supply and average import price during winter season

(sources: Customs, CIRAD)



Avocado – European Union – Main supplier countries during winter season

in tonnes	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17*
Chile	51 383	25 244	32 637	41 074	62 968	42 797	78 244	88 000
Mexico	9 326	3 371	2 909	9 085	6 293	12 918	45 593	35 000
Spain	31 420	48 600	38 900	38 500	36 700	50 600	37 700	50 000
Israel	38 522	38 512	40 448	35 175	42 844	46 086	34 995	63 000
Colombia	51	121	121	486	1 142	3 740	11 189	22 000
Total	130 702	115 848	115 015	124 320	149 947	156 141	207 721	258 000

*Estimate / Professional sources, Customs



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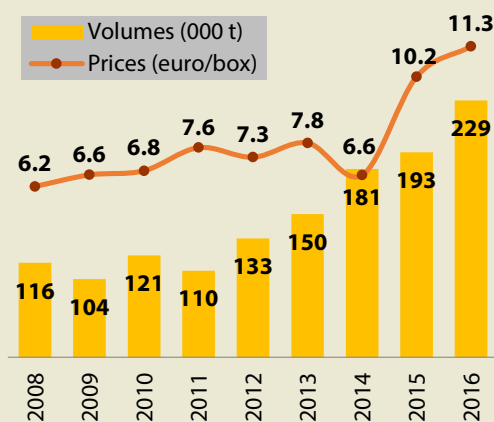
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Review of the 2016 avocado summer campaign: order and beauty, luxury, calm and delight

Experience has shown that summer campaigns rarely run smoothly. While average campaign prices remain decent as a general rule, periods of troughs are not uncommon, or even practically systematic. The 2016 campaign is the first to buck the trend. The market remained under control, with the danger period of mid-May, when Peruvian volumes usually boom, having been negotiated rather well (prices suffering a minor mishap, but still maintaining a high level). Hence our average price indicator for the campaign registered a record level of more than 11 euros/box. However, volumes were not lacking. Indeed the supply exceeded 230 000 t for the first time, marking a rise of 20 % from the previous season. As usual, Peru was practically the sole architect of this surge in volumes. The production increase, more moderate than predicted because of unfavourable climate conditions, helped boost the Community market supply, especially since US purchasers proved even more hesitant than in 2015. South African volumes were surprisingly large. Despite the production losses due to the drought and several heavy hailstorms in Limpopo, exports hit the top of their range. Similarly, Kenya confirmed rise to prominence. Shipments were up to both the EU-28, where Hass is now practically the sole variety exported, and to the new Arabian Peninsula markets. Conversely, the outsiders were in poor form, with volumes from Tanzania and Brazil practically stagnating.



Avocado - EU-28 - Supply and average import price during summer season
(sources: Customs, CIRAD)



Avocado – European Union – Main supplier countries during summer season

in tonnes	2009	2010	2011	2012	2013	2014	2015	2016
Peru	45 661	56 345	66 155	62 618	86 260	101 971	114 321	144 367
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Total	104 659	121 067	112 021	133 291	150 092	181 686	193 399	229 231

*South Africa + Zimbabwe + Swaziland / Sources: Customs, CIRAD



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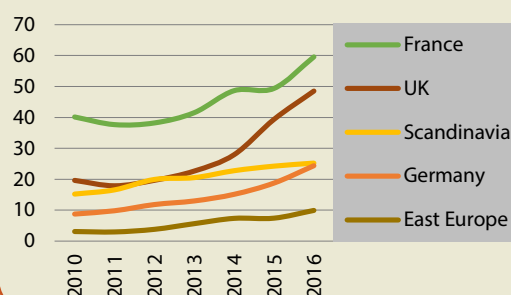
Summer avocado consumption: no let-up from the heavyweights!

Which countries benefited most from these heaven-sent additional volumes? The answer is simple: all, or nearly all, the heavyweights. The French market, the number one in terms of volumes, is far from maturity; as is demonstrated by scoring the biggest rise in 2016, taking in just over 10 000 t extra. The United Kingdom came in second position, though with a smaller increase of approximately 9 000 t. Annual consumption exceeded 1.4 kg per capita in 2016. The dynamic did not let up in Germany (consumption gaining nearly 6 000 t during summer 2016), with a massive margin for progress still remaining (consumption less than 600 g per capita in 2016). Europe's most populous country now consumes similar volumes to Scandinavia, where the dynamic remains steady but fairly slack. Norway and Denmark remain by far the European number ones in terms of consumption per capita, with 2.4 kg per year. Sweden and above all Finland are quite a long way behind, with 1.9 and 1.4 kg/capita/year respectively. The good news is that the interest from the Italians in the avocado seems to be solidifying, although still in its infancy. Consumption has practically doubled in two years, exceeding for the first time the 10 000-t mark. With consumption per capita still less than 200 g in 2015-16, it may be a new growth area, with a population of more than 60 million in the process of being converted!



© Guy Bréhinier

Avocado - European Union
Apparent consumption during summer season
(in 000 tonnes / sources: Eurostat, Bank of Norway)



Avocado – EU-28
Estimated consumption per capita

	Population (million inhabitants)	Summer 2016 (in g/capita)	2016 (in g/capita)
Scandinavia	24.5	1 029	2 001
Denmark	5.4	1 243	2 360
Sweden	9.1	994	1 887
Norway	4.7	1 251	2 433
Finland	5.3	676	1 433
France	63.4	940	1 731
United Kingdom	60.8	798	1 426
Germany	82.3	296	570
Eastern Europe	102.2	97	256

Source: Eurostat

Avocado – EU-28 – Main markets apparent consumption during summer season (May to October)*

in tonnes	2010	2011	2012	2013	2014	2015	2016	2016 compared to	
								2015	2009-2010 average
Germany	8 748	9 816	11 819	12 989	15 129	18 767	24 377	+ 30 %	+ 216 %
Scandinavia**	15 204	16 568	19 937	20 520	22 766	24 240	25 220	+ 4 %	+ 79 %
France	40 131	37 659	38 205	41 525	48 639	49 362	59 570	+ 21 %	+ 60 %
United Kingdom	19 631	17 889	19 654	22 647	27 940	39 364	48 514	+ 23 %	+ 153 %
Eastern Europe	3 097	2 965	3 808	5 644	7 358	7 421	9 924	+ 34 %	+ 291 %
Total	86 812	84 897	93 422	103 325	121 832	139 154	167 605	+ 20 %	+ 107 %

*incl. main Customs declarations for South African, Peruvian and Kenyan volumes / **incl. Norway / Sources: Eurostat, Bank of Norway

El Niño Costero: what is it?

The weakening of the South Pacific anticyclone and its cool air current enable warm winds from the Equator to reach the Eastern Pacific. The Ocean is warmed up and humidity increases. As it condenses, this humidity causes deluges — in no way inferior to a conventional El Niño — which hit the northern coast of Peru in particular. This phenomenon is sometimes a precursor for a worldwide El Niño phenomenon (see *Direct from the markets* on page 2).

World Avocado Organization: first actions in the EU-28 in 2017

The organisation, which held its first meeting in February 2017 in Berlin, should start its promotion operations aimed at developing Hass consumption in Europe in 2017. The details of the programme are not yet known at the time of writing. The target markets should be France, Germany, the United Kingdom and Scandinavia.

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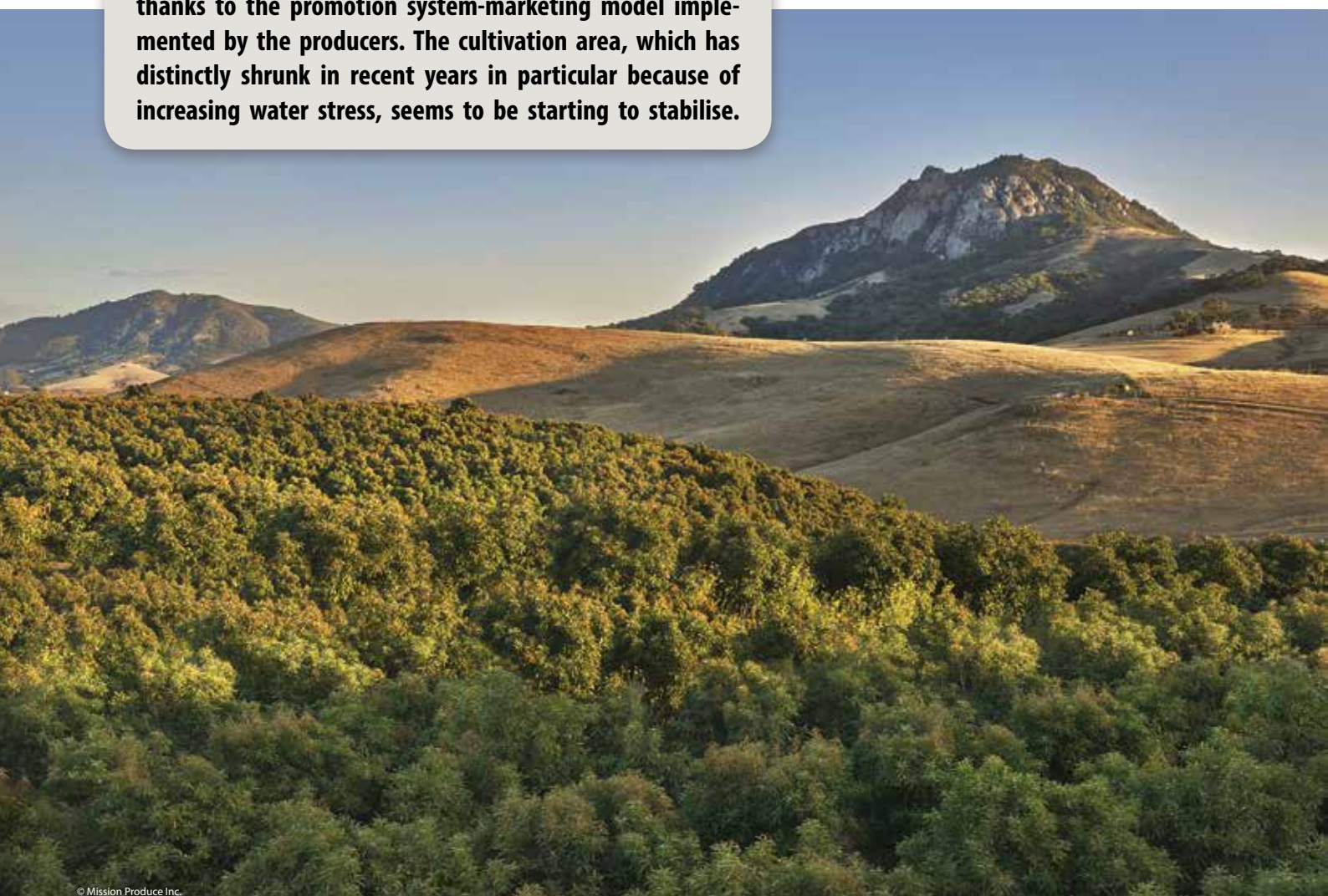
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Producer country file

The avocado in California

by Eric Imbert

One of the pioneers, the Californian avocado industry is packed into the frost-free coastal zones in the south-east of the State. The nearly all-Hass harvest, averaging 160 000 t though with marked alternate bearing, is nearly exclusively sold on the local market, highly dynamic thanks to the promotion system-marketing model implemented by the producers. The cultivation area, which has distinctly shrunk in recent years in particular because of increasing water stress, seems to be starting to stabilise.



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Avocado – California

Location

With a cultivated area of approximately 20 000 ha, California is by far the USA's main avocado production centre, accommodating practically all the Hass (approximately 2 750 ha mainly West Indian varieties in Florida, in Dade and Collier Counties, and less than 200 ha comprising mainly Guatemalan cultivars such as Sharwill on Hawaii). In terms of value, the avocado is one of the State's main horticultural products, behind the strawberry and lemon. Surface areas are mainly packed into the coastal strip and valleys of the south-east, where the temperate Mediterranean or warm oceanic climate safeguards against the high frost risks inland. Riverside and San Diego Counties alone encompass nearly half of surface areas in a main area situated between Temecula in the north and Escondido in the south, plus a few orchards to the east of San Diego city. Ventura County is the State's other main production centre, accommodating just over one third of surface areas. The orchards are mainly situated in the Santa Clara river valley (from Ventura to

Fillmore), in the neighbouring valley further south (from Oxnard plain to Simi Valley) and in Ojai valley. Ventura County comes in third position (approximately 10 % of surface areas), with its plantations mainly situated on the narrow coastal strip between the sea and the Santa Inez Mountains. The rest of the cultivation area is packed into San Luis Obispo County (Morro Bay and the Santa Maria River valley in particular).



Avocado – California

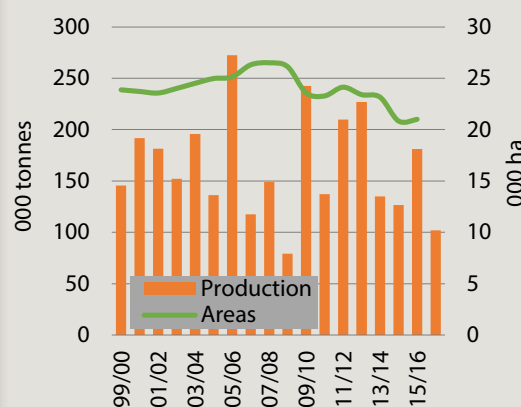
Production

California was among the trailblazing regions in developing a dedicated avocado industry. The first avocado trees were introduced in the mid-19th Century, with commercial orchards first planted from the very start of the 20th Century. The Californian industry was also the first to become organised, with the creation in 1915 of the California Avocado Association (which would become the California Avocado Society in 1941), responsible for representing and supporting producers in trading/marketing or technical matters, with the support of UC Riverside. After making gradual progress, avocado surface areas took off in the early 1970s, peaking at more than 30 000 ha in the late 1980s. The resulting production boom caused a steep fall in profitability, in a context of ebbing demand for oily foods and the arrival of Chilean competition. Surface areas declined, before stabilising at 25 000 ha between the mid-1990s and 2008-09. This downward trend in surface areas has resumed since then, with the cultivation area losing just over 5 000 ha between 2008-09 and 2015-16. Agricultural water, increasingly rare and expensive, has become a major constraint in recent years of intense drought, particularly in the south (San Diego area), where salinity is an additional problem. Similarly, the lack of agricultural labour, primarily of Mexican origin, is increasingly perceptible. In this context of very high production costs, only the most high-tech producers have good profitability. A good many smallholders, who until recently represented a significant production base (approximately one quarter of surface areas in 4 800 facilities of less than 6 ha according to the latest census dating from 2012) have had to withdraw from the industry in recent years. Production, within a wide range though on average 160 000 t since the beginning of the decade, could find stability in the coming years thanks to a stabilising cultivation area and research efforts made to increase productivity.



Avocado - California - Production

(source: CAC)



Avocado – California – Production costs

in USD/ha	San Diego	Riverside	Ventura/ Santa Barbara	San Luis Obispo
Direct costs excl. irrigation	4 565	4 565	4 429	4 429
Irrigation	10 882	6 107	2 180	1 409
Harvest	4 355	4 355	4 469	3 482
Total direct	19 802	15 027	11 078	9 320
Others	12 279	11 204	15 892	15 880
Total	32 081	26 231	26 970	25 200

Source: University of California Davis, 2011

Avocado – California

Varieties

Until the early 1970s, the varietal base was based mainly on Fuerte, given its name by Californian producers for being the only one to withstand the frosts of 1913. It was gradually superseded by Hass, a variety discovered locally by the postman and amateur horticulturalist of the same name, and patented in 1935. This variety currently occupies 95 % of the cultivation area, with Lamb representing the bulk of the remaining areas (2 % other varieties). The first volumes are generally sold in January (San Diego region), with production not really taking off until early March, before peaking in early May to late July. The campaign winds down in August, before finishing toward October / November with the last fruits from the Santa Barbara and San Luis Obispo zones.



Avocado – California Planted areas by variety

Varieties	Shares	Hectares (thousand)
Hass	95 %	48.5
Lamb	3 %	1.6
Others	2 %	0.8

Source: CAC

Avocado – California – Harvest calendar

	J	F	M	A	M	J	J	A	S	O	N	D
San Diego/Riverside												
Ventura/Santa Barbara												
San Luis Obispo /Monterey												

Source: CAC



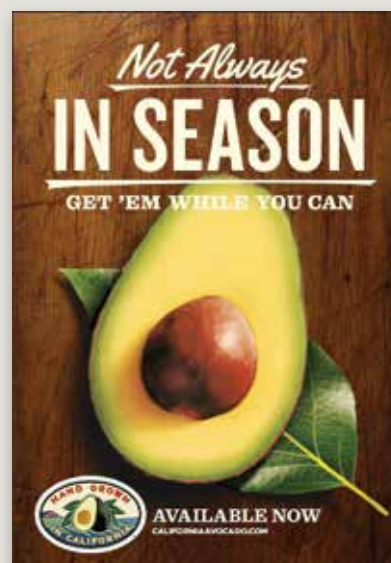
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Avocado – California

Outlets

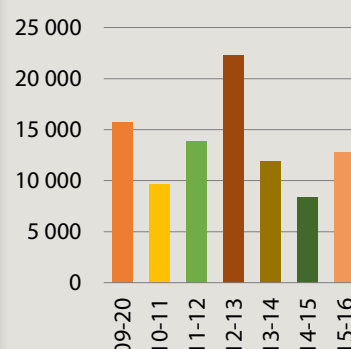
The local market absorbs more than 90 % of production, and is the industry's natural outlet. Californian producers, connected at a very early stage via the trans-continental rail network to the main markets of this highly populous but vast country, were aided in getting established by the import ban imposed on competing produce from Mexico and Central America from 1914 to 1997. After laying the foundations of a trading organisation in 1924 with the creation of a cooperative type entity (California Avocado Exchange, which became Calavo in 1927), the California Avocado Association also launched large-scale marketing actions at a very early stage, in 1961 setting up a funds collection system (Avocado Marketing Order) via its Promotion Committee, and then via the California Avocado Commission from 1978. The industry was able to convert into a market development opportunity the danger posed by the lifting of the import bans on Central and South American produce in 1997. By extending the Marketing Order to imported avocados by setting up the Hass Avocado Board in 2002, the US market practically expanded fivefold. True, the market share of the Californian industry fell to 15-20 %, but the volumes sold are similar and the economic returns higher. The bulk of volumes are traded by a dozen companies, with Calavo, Mission and Westpac among the leaders.

The fruits are primarily packed in two-row 25-pound lugs, i.e. 11.34 kg (there is also a 12.5-pound or 5.67-kg version). The sizing is indicated by number of fruits per 11.34-kg lug (generally 28 to 84, with 40 representing the equivalent of a size 14 in a 4-kg box).



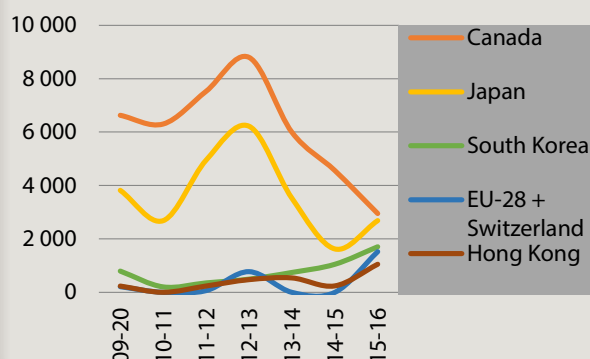
Avocado - USA - Exports

(in tonnes / source: US Customs)



Avocado - USA - Exports by destination

(in tonnes / source: US Customs)



Exports

Export volumes are minimal, at around 10 000 t per year (90 % of total US avocado exports, fluctuating from 9 000 to 15 000 t). The bulk of volumes are aimed at Canada (40 to 50 %) and at the Asian markets (Japan, South Korea and Hong Kong, totalling 35 to 45 %). Shipments to the EU-28 are very limited (0 to 1 500 t, depending on the season).

A report by
Denis Loeillet

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Banana

European market

Long may the party continue!

For the moment, everything is going well. Consumption for early 2017 is on a rather positive trend. The climate vagaries are doing their job of undermining the world supply, while import prices have finally recovered somewhat after 14 flat weeks. So long may the party continue, and let's hope for brighter days still to come!



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While we might characterise 2016 as a transitional year in price terms (**Fruitrop** no.246), it is best described as a year with no overall trend in terms of market volumes. The world's various markets began the year 2016 in disarray. On the one hand, the vast zone comprising the EU-28 and Russia was characterised by a very considerable increase in consumption. On the other hand, the United States, Canada and Japan registered a very mixed performance for 2016, with net imports at best stagnating, and net consumption per capita flagging.

These are two pieces of the same international market estimated at more than 18 million tonnes, which has seen its supply steadily rise for the past several decades. For the moment, everything is going well. The Community market and the Russian market (a nice surprise for 2016) are absorbing bigger quantities than ever. As proof, the EU-28 consumed more than 6.1 million tonnes in 2016, i.e. an annual growth rate of 4.5 %! More than an additional 260 000 t found its way into European's already well-filled stomachs. If we add to that the Customs declaration errors (with some even talking of Customs duty fraud), relating to 45 000 t of bananas reclassified as plantains (see inset), the EU imported nearly 300 000 t more in 2016; achieving the biggest rise since 2014 on a constant area basis (28 Member States). Since 2012, the additional volume has climbed to nearly 900 000 t! There can be no more talk for this sector of a featureless, listless, flat or amorphous market. Indeed consumption per capita in 2016 hit the unexpected mark of 12 kg!



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Plantain: scrapping in Customs

Trying to make a silk purse out of a sow's ear is nothing new. In every case, it is the lure of bigger profits which leads to someone crossing the line. In view of the sums at stake, we might well query the case of the plantain banana in the United Kingdom in 2016. Indeed, analysis of the flows tallied up by Eurostat shows a record British craving for these cooking bananas.

European plantain imports have been relatively stable for years. Since 2012, the EU-28 have imported between 73 000 and 86 000 t of this vegetable-cum-fruit. So it was quite a surprise in 2016 when this amount leapt up by 53 % to 131 000 t! And it was Colombia, which shares the market with Ecuador, which was on fire. The Latin American origin actually doubled its plantain exports to the EU. Which really is bizarre, since at the same time, Colombian Customs remained impassive, announcing a figure comparable to those of previous years.

Upon closer examination, it turns out that it was the United Kingdom which imported this surplus of plantain banana, during the 1st half of 2016: dessert banana and plantain banana, much of a muchness really. Why split hairs over a few thousand tonnes? Well, because in the eyes of Customs regulations, things are very different. In 2016, the dessert banana from Colombia was subject to a Customs duty of 103 euros/tonne, whereas the plantain banana is duty-free.

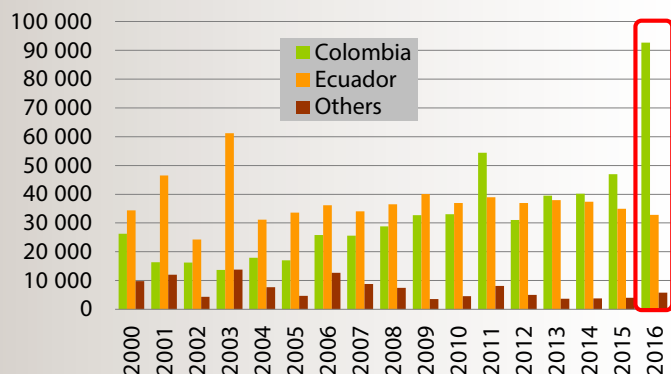
Ultimately, this is an expensive bill, amounting to 4.7 million euros. It was doubtless just a Customs declaration error. We can't ask every Customs agent to be able to distinguish a dessert banana from a cooking banana. So to facilitate the job of the importers, forwarding agents and Her Majesty's services, we will reiterate the Customs codes, for no charge:

- Dessert banana: 08 03 90 10
- Plantain banana: 08 03 10 10

As for the 4.7 million euros, the Chief Negotiator for Brexit need only add it to the 40 to 60 billion euros bill that the EU wants to charge the United Kingdom.

Plantain - European Union - Imports

(in tonnes / source: Eurostat)





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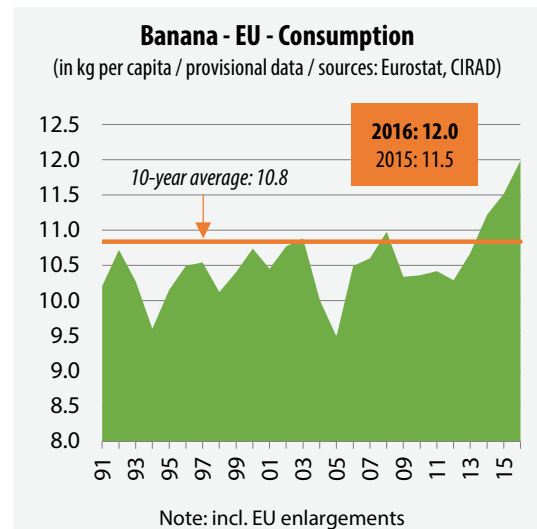
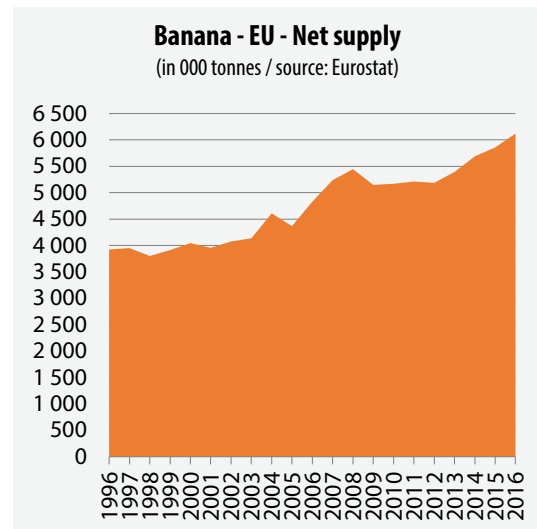
Thanks to the NMS

If we switch from a macro analysis to a micro analysis, the elation falls flat. Since while everything is going well for the EU-28, we cannot see the woods for the trees. If we switch our lens, things look much more complex and less rosy. While there is a massive increase, it is above all due to the process of the New Member States (NMS) playing consumption catch-up. Starting well below the European average, the majority of these countries are gaining hundreds of grams per capita every year. For some, the margin is still substantial, with consumption levels 3 to 4 times less than the European average. It is hard to be very precise, given how tricky it is to identify and analyse intra-Community flows, but we can assert that the orders of magnitude are at least correct.

By way of example, we might take the Czech Republic which went from 8.3 to 12.4 kg per capita between 2012 and 2016, or the Baltic States, where consumption gained 4 kg to go from 6.9 to 11 kg. The poor performance by Poland, the number one market by volume in the Eastern EU (270 000 t in 2016), which saw its consumption decrease by nearly 1 kg, is worrying. However, it doubtless arose due to the effects of the Russian embargo on European fruits and vegetables, catastrophic for Poland, a big apple producer and traditional exporter to Russia. In 2013, 676 000 t were exported to Russia, as opposed to only 116 t in 2015 and 156 t in 2016! While the banana remains an ultra-competitive product in the retail sector, and despite proven episodes of bypassing the embargo via Belarus, competition from the apple is inevitably tougher under these circumstances. Furthermore, in 2016 import prices remained firm, at least until September, which doubtless curbed enthusiasm to some extent. In addition, the Polish zloty was devalued slightly against the euro, dropping to its lowest level since 2011, thereby raising the value of imports.

Despite this hiccup, the annual consumption per capita in the NMS went from 5.3 to 7.6 kg, throughout the current growth cycle which began in 2012. There are still considerable gaps between the mature markets such as France or Germany and the boomers, but they are narrowing year on year. This is a good thing for the balance of the banana market, since the quantities taken in are by definition produced and supposedly placed on the market in any case, and in Europe in particular. Indeed the European market is characterised by multiple operators, which favours sometimes economically unreasonable behaviour, and the tariff and non-tariff barriers are scant deterrent as long as the Customs duty is paid.

The overly mechanistic and theoretical view that the supply and demand curves can be instantly adjusted by the price does not apply to the banana sector. In any event, the adjustment is a long and often very painful process. Especially since there are numerous players, their individual strategies can be highly contradictory, they split their risks by diversifying their outlets, the intermediate links do not necessarily take all the market risks, the relative competitiveness of each origin and each operator differ (cost structure, exchange rate, productivity, etc.). In addition, certain origins are in the midst of replanting following climate damage, regardless of the supply level upon returning to the market. In short, the world banana ship, once up to full speed as is the case at present, has a momentum which prevents any excessively sudden or significant changes of heading.





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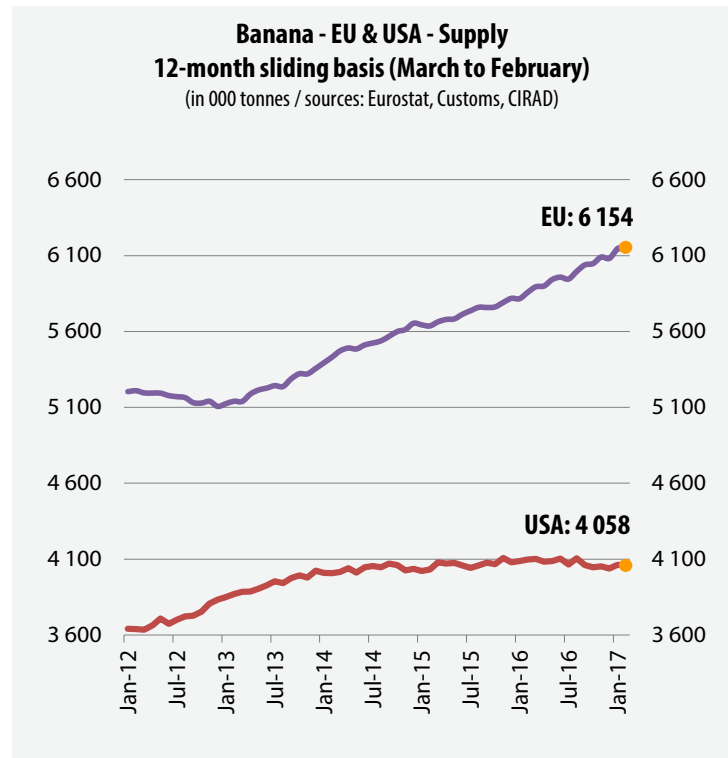
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Leap in consumption in early 2017

So to prevent a shipwreck, or more prosaically a price collapse, world demand must continue to grow at a high tempo. This of course means a headlong rush, but there are no other apparent solutions, apart from a brutal price revision. It is only the EU and Russia that have driven the growth, with the United States and Canada stalled, as is Japan. Russia has seen an abrupt but essential increase: + 10 % in one year to 1 356 000 t. This set an absolute record (see Russia inset). Consumption per capita is nearing 10 kg, as opposed to 6 kg in the mid-2000s. This is particularly satisfying since this country continues to procure exclusively from Ecuador, a country with the greatest scope for growth. However, it is difficult to believe that the Russian market could continue to grow at this tempo, unless the country's monetary reserves improve when the oil price starts to recover, but this is far from certain.

Which leaves the EU: will it continue to drive world demand? The opening months of 2017 undoubtedly prove that this may still be the case. Indeed imports climbed by 11 % over the first 2 months of 2017, with Ecuador (+ 15 %) and Costa Rica (+ 37 %) leading the way. As for the ACPs, Côte d'Ivoire (+ 12 %), Belize (+ 30 %) and Ghana (+ 25 %) are exhibiting an excellent trend. The no.1 ACP origin, the Dominican Republic, registered a cyclical shortfall of 16 %, though this will very rapidly be made up, such is the strength of the replanting trend after the massive floods of late 2016. If we add the bananas produced on European soil to the imports, the gain is more modest, though it is still substantial, in excess of 7 %. As a reminder, throughout 2016, everyone lauded a spectacular increase of 4.5 % (excluding the "plantain" effect).

Things also got off to a good start on the US market, the first two months registering a solid + 3 %; though this is misleading with an exceptional January (+ 8 %) distorting the trend. However, let's not spoil our satisfaction at seeing the world's top two importers absorb more volumes, especially since Russia seems to be in on the trend. According to the figures of the CIRAD Market News Service, it imported 3 % more in Q1 2017 than over the same period of 2016, and actually + 14 % on the three-year average.





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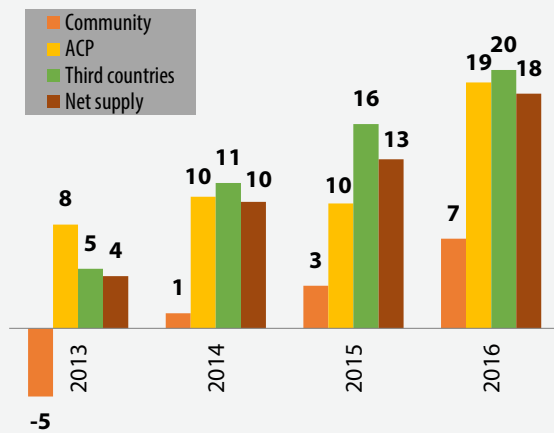
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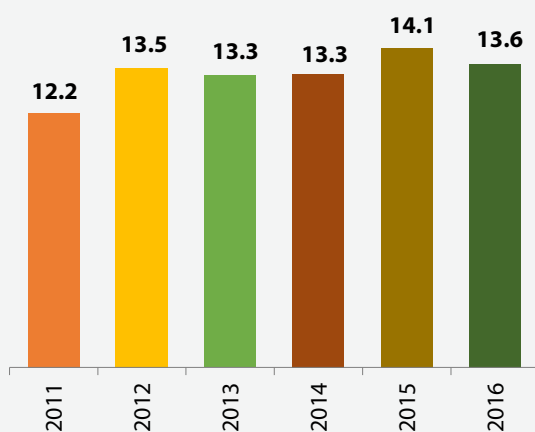
Banana - European Union
Supply dynamics by group of sources
 (Index 0 base 2012 / sources: Eurostat, CIRAD)



14 weeks of patience

So everything is perfectly peachy on planet banana. Imports are on the increase across the board, although we cannot yet talk about a significant trend, except for the EU. Yet is there total satisfaction? No, given the drop in prices over Q1. Indeed, it took 14 weeks for certain European markets to get back to their 2015 or 2016 levels, though these were highly satisfactory. Over the first two months of the year, it is easy to compare volume and value. In January, imports leapt up by 16 % from one year to the next, causing a 32 % fall in green banana prices in the EU (CIRAD-FruiTrop EU barometer reference). The same occurred in February, with a shallower price fall (- 11 %), probably reflecting a smaller increase in imports (+ 6 %).

Banana - EU Barometer - Import price
 (euro/18.14-kg box / Source: CIRAD-FruiTrop)



Two points on a curve in no way make a trend, but at this early stage of 2017, there is no need for econometrics to establish the negative relationship between volume and price. This relationship can also be verified on other markets such as France or Spain; starting with Spain, where 2016 was for operators an annus horribilis. We actually need to go back to 2010, or even 2004, to find an annual average import price of 14 euros/box (Canarias Super Extra platano category). That is over 2 euros less than in 2015, and indeed 3 euros less than in 2014. Unsurprisingly, Canaries production in 2016 set a new record of 417 000 t. The last two years when production was as high were, curiously enough, 2004 and 2010. It is true that Spain is not Europe. Its market is anachronistic in that it reserves a preferential place for its domestic produce (the Canaries platano). Consumer chauvinism means that they pay 50 % more than for the common banana (all other origins, including Community origins).



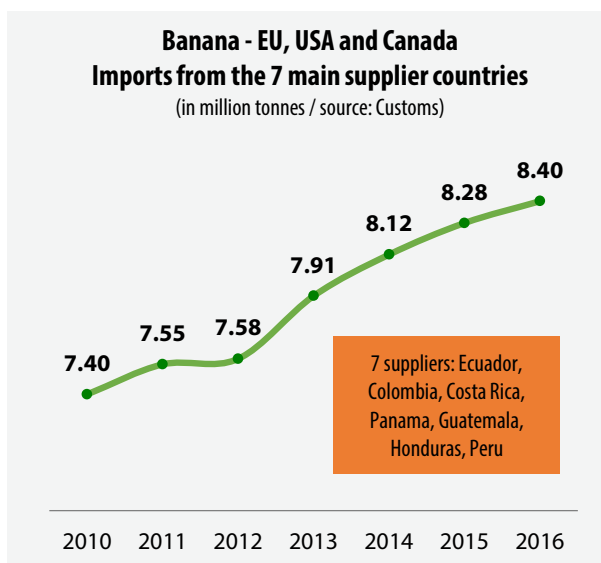
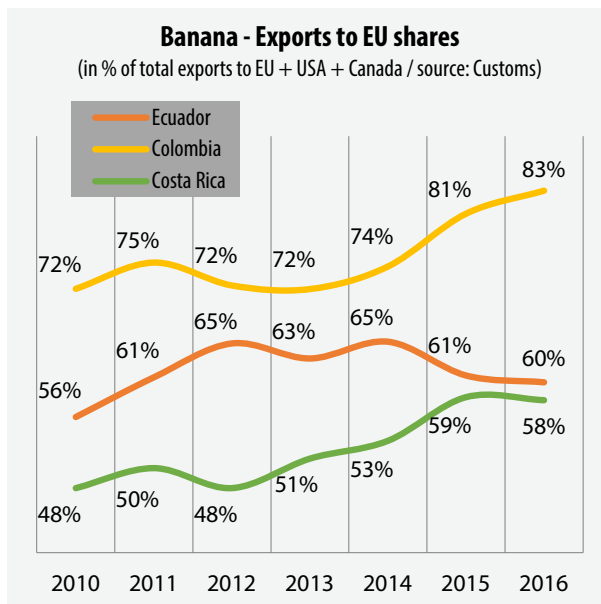
© Pauline Feschet

France: playing possum

Let's now look at France, which though it consumes some of its domestic produce like Spain, is also largely open to ACP and dollar bananas from all origins. It has no Iberian-style favouritism. Price is what counts above all, despite the successful attempt, though recent and limited in terms of volume, to distinguish the Guadeloupe and Martinique banana ("Francité" initiative, see **Fruitrop** no.237). So what can we observe? Volumes consumed in 2016 fell (- 2 %), yet import prices remained the same as in 2016, at a level regarded by all as decent. It was in Q4 that things began to slip, when pressure from volumes intensified without there being a good demand dynamic to match - QED. The first two months of 2017 in France confirm this antagonistic relationship between volume and price, such a classic in economics and perfectly verifiable.

It is clear that the banana market is not isolated from the rest of the economy. So it is influenced by the supply of competing produce, just as it influences other markets. It is affected by other really classic factors. The exchange rate for example, which favours imports from the franc zone (Cameroon and Côte d'Ivoire) or Colombia. Its effects are powerful for the latter supplier, which is free to choose between selling to the near-neighbouring United States or to Europe. It seems to have made its choice, earmarking 83 % of its total exports for the EU in 2016. This figure was just 72 % in 2013. We can of course find a variety of explanatory factors, but it does seem that the exchange rate effect wins out in this trade-off.

Below we will set out the supply dynamic for the world's major markets by origin. In general terms and in the long run, we can draw some lessons from studying banana flows, especially to the EU. While the European market has gained more than 900 000 t since 2013, it is the dollar origins which have mostly benefitted, as well as the ACPs. Due to their weight on the market (70 % market share), the dollar bananas have seized the bulk of the increase with 700 000 t. The ACPs have taken a large part of the remainder (190 000 t). European produce has had to settle for the scraps (45 000 t). By relative share, things are completely different. ACP suppliers are neck-and-neck with the dollar origins. As proof, if we start with an index of 100 across the board in 2012, in 2016 it had climbed to 120 for the dollar origins and to 119 for the ACP origins. Only European production has confirmed its marginalisation, though with an index of 107, it remained in the black despite its structural handicaps.



Added value against productivity gains and inflation

Let's finish this overview, which appears rather positive in tone, on a slightly more pessimistic note. Five years of relatively good and above all stable prices have acted as a powerful anaesthetic on intermediate operators. It would very much seem that Maat, the Egyptian goddess of order and balance, is looking kindly over the European banana market, and that Isphet, her antithesis, is no more than a distant bad memory of the time when the market was indifferently managed through quotas and customs duty, or even national rules.

Yet it would be a grave error to think too positively. Isphet can be found in the details. While in the European economies, which have been on the brink of deflation for years, we can refrain from looking at prices on a constant basis over a short period, it would be rash to disregard inflation over the long run (several years). It is gnawing away at both household and operator purchasing power; and all the more so since the product's value chain is globalised. Hence, at least for the downstream part of the industry, analysis on a constant euro basis is a must. In order to take the analysis by origin a bit further, we could even consider using the purchasing power parity method. This would make it possible to compare the product value between countries. Yet if we settle for simply factoring in inflation, even this modest calculation provides powerful lessons.

We should reiterate again that since 1993, the import price of the banana on a current euro basis has constantly declined. Whether on a constant euro basis from 1993 or from 2006, there is no denying the added value loss trend. In the long run (24 years), the constant import price has lost nearly 40 % of its value, going from 650 to 400 euros/tonne. As in any industry, we can assume that the production systems have not remained isolated from productivity gains. All other things being equal (energy prices, labour cost, treatments cost, breakdown of added value, exchange rate, etc.), a proportion of this 40% fall was absorbed by the favourable trend of the export yield per hectare, for example. This is not the only figure telling us about productivity, but it is one of the only ones for which we have historic series. For Costa Rica, over a period of just 20 years, productivity rose by less than 8 %, going from 2 300 boxes/ha in the late 1990s to 2 500 boxes/ha in 2015. True, there is no doubt that along with Guatemala it is the world's highest producing country. The situation is definitely different in Colombia or Ecuador, and the gains more substantial since their productivity is lower. However, this does not fully explain the constant-basis price fall.

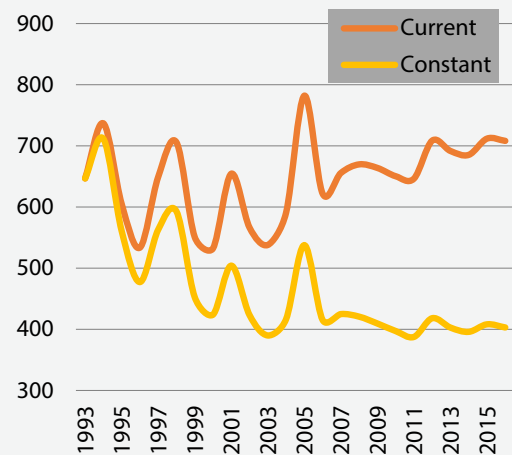
If we cannot fully explain the fall in value by productivity, it would seem that added value has been destroyed in the industry. That remains to be evaluated. The consumer is of course one of the big winners in this impoverishment of the production and trading industries. So one of the objectives of the European policy has been successful, with producers in particular left to pay the price.



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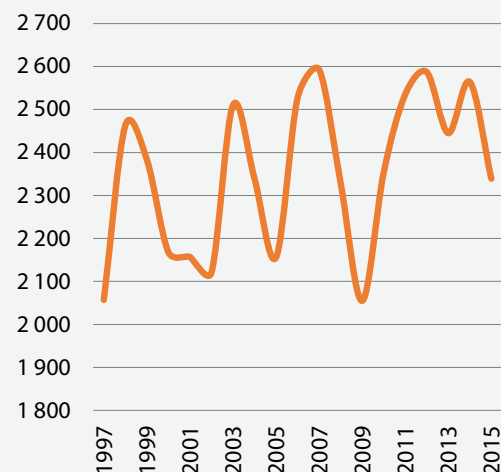
Banana - EU - Import price analysis Example of France

(in euro per tonne / source: CIRAD)



Banana - Costa Rica - Productivity

(in US box per hectare / source: Corbana)



Banana — European Union — Evolution of supply – Tonnes

Year	Banana type or source			Sub-total	Exports	Net supply
	Community	ACP	Others (\$)			
1996	684 605	798 109	2 471 263	3 953 977	30 598	3 923 379
1997	810 537	692 731	2 464 412	3 967 680	16 571	3 951 109
1998	786 232	614 459	2 426 419	3 827 110	26 448	3 800 662
1999	729 303	688 170	2 522 455	3 939 928	27 359	3 912 569
2000	782 176	770 095	2 528 170	4 080 441	35 327	4 045 114
2001	767 268	747 131	2 474 665	3 989 064	34 284	3 954 780
2002	790 622	738 439	2 554 508	4 083 569	8 011	4 075 558
2003	765 416	797 269	2 578 827	4 141 512	6 020	4 135 492
2004	758 206	782 979	3 077 361	4 618 546	11 029	4 607 517
2005	648 375	763 974	2 959 463	4 371 812	4 970	4 366 842
2006	641 559	889 176	3 306 538	4 837 273	8 386	4 828 887
2007	554 734	842 959	3 848 266	5 245 959	9 270	5 236 689
2008	567 560	918 923	3 968 269	5 454 752	10 002	5 444 750
2009	608 048	958 326	3 587 737	5 154 111	7 840	5 146 271
2010	659 525	1 023 661	3 492 406	5 175 592	7 437	5 168 155
2011	611 841	978 537	3 628 113	5 218 491	8 169	5 210 322
2012	648 459	982 336	3 559 785	5 190 580	5 237	5 185 343
2013	614 564	1 060 467	3 722 253	5 397 284	5 274	5 392 010
2014	655 980	1 081 268	3 956 190	5 693 438	6 427	5 687 011
2015	669 673	1 076 315	4 116 432	5 862 420	6 556	5 855 864
2016	692 954	1 167 203	4 263 535	6 123 692	6 556	6 117 136

(1)

(2)

(2)

(3)

(1) 1988 to 1993 inclusive: Eurostat + European Commission data for Madeira and Greece. From 1994 onwards: supplementary aid data or POSEI.

(2) Eurostat data.

(3) Duty-paid bananas (released for free circulation) in one of the EU-28 member countries and then exported outside EU-28.

General note: before 1994: dessert bananas + plantains / From 1994 onwards: dessert bananas. Before 1995: EU-12 / From 1995 to 2003: EU-15 / From 2004 to 2006: EU-25 / From 2007 to 2013: EU-27 / From 2014: EU-28. The study concerns extra-Community import data for ACP and dollar bananas and re-exports. The rules of the Common Market Organisation of Banana (1993 version) have been applied to the data from 1988 onwards in order to give comparable results.

Source: Eurostat, European Commission / Processed by CIRAD Market News Service



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Trade agreements: Act II Scene 1

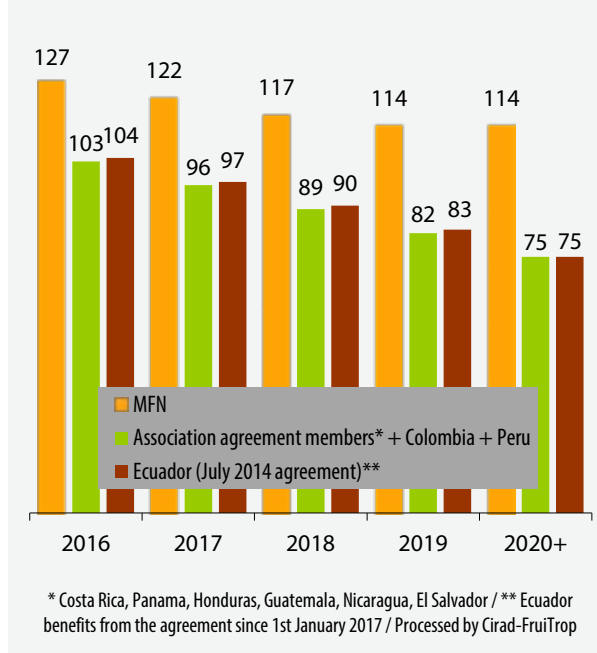
This is one of challenges of the long period of discussions getting underway, which will lead to scrutiny of European banana policy. The issues of pegging customs duty at 75 euros/t and of tailoring support policies to European producers, or of compensation for ACP producers, are on the table. For their part, Central and South American producers are aiming to completely dismantle tariff barriers. A new legal battle is beginning; a golden age for law firms and lobbies which have not forgotten the highly prosperous period of the banana CMO, which for them extended from the early 1990s, before its implementation, until the major reform in 2006.

And there is no lack of regulatory challenges. Between negotiations of new trade or association agreements and modernisation of old ones, the EU is constantly opening up a host of fronts. So vigilance is the watchword with whichever country discussions are opened, for two reasons. The first relates to the production and export potential of the dessert banana in the countries in question, and to its status in terms of agreements already in place with nine partners, all Latin American. For Mexico, for instance, a big banana country, it would be inconceivable, as part of modernisation of the agreement, to expand the duty-free quota the country enjoys in the EU. It would be even more dangerous for the market balance to lower the customs duty (122 euros/t above 70 000 t) currently applied to below that negotiated with Colombia, for example. Since the most advantageous duty level would immediately and automatically apply to all the agreement signatories, i.e. practically 100 % of the EU's dollar imports. While the risk is evident in the case of Mexico, it is latent for countries with currently few or no exporters, such as Vietnam or the Mercosur countries. The second point to be wary of relates to the rule of origin. World trade routes are often counter-intuitive, incorporating transits and transshipments. Hence Ecuadorian bananas could, after passing through a Canadian or US port, be re-exported to the EU, losing all traces of their producer country. To counter this bias, the rule of origin is conventionally applied in the agreements, as was the case with Canada.

The suicide jumper is doing fine... for now

In the shorter term, the calming effects of the climate vagaries, exchange rate or increasing energy costs will do their work. It is now impossible to predict a difficult year, so seldom are the predictions borne out. If we look at the sector as a whole, this is rather a good thing. If we look at

Banana - EU - Customs duty for third countries excl. ACP
(euro/tonne)



the individual situation of each country, it is sometimes dramatic. The cyclone in Martinique and the floods in the Dominican Republic from late 2016, or the El Niño Costero (late 2016 and early 2017) in Peru and in Ecuador, hit the production capacities of some zones more or less hard. As this spring begins, late frosts (or black frosts) on fruit trees e.g. apples in some European countries could hold back the competition. European strawberry campaigns, late and moderate, have not destabilised the banana market either. The ongoing cold weather has favoured banana consumption.

Nonetheless we will monitor the return to production of zones hard hit in late 2016, against the backdrop of the start to the stone fruits seasons (cherry, apricot, peach and nectarine). As for the exchange rate and energy, there is no change for the moment, with analysts awaiting the results of major elections in Europe and announcements of economy boosting measures in the United States.

In summary, like the suicide jumper falling from a skyscraper, everything is going fine... for the moment; since we do not know how high the tower is, and therefore how long it will take to reach the ground. Like the jumper, we are betting on the operators not fully applying their famous slogan: "Carpe diem quam minimum credula postero". And it is true, they should seize the present day, but above all handle the following days, sure to bring disillusionment ■

Denis Loeillet, CIRAD
denis.loeillet@cirad.fr

Banana — EU-28 imports — 2016

in tonnes	AUT	BEL	BUL	CRO	CYP	CZE	DEN	EST	FIN	FRA	GER	GRE	HUN	IRE	ITA	LAT	LIT	LUX	MAL	NET	POL	POR	ROM	SLOK	SLO	SPA	SWE	UK	Total	
Intra-EU	126 092	94 242	8 732	36 167	1 816	192 441	71 356	16 813	28 163	289 659	724 358	2 035	37 679	8 453	54 850	28 120	20 906	5 316	1 225	134 313	148 539	99 038	100 059	68 107	8 007	127 468	51 436	116 734	2 602 122	
MS-12, incl.	125 795	94 176	5 325	10 057	1 816	182 561	71 355	7 357	28 110	289 537	721 905	1 638	22 681	8 327	52 683	12 933	12 569	5 316	1 178	134 313	143 484	99 038	65 430	24 409	6 775	127 407	51 436	116 729	2 424 342	
Belgium	32 813	0	97	1 310	0	53 983	890	0	232	159 159	403 106	0	40	562	2 192	3 090	4 381	5 191	0	43 665	60 036	51	14 633	13 911	184	4 774	14 855	12 342	831 494	
Netherlands	51 622	65 059	1 078	3 892	0	47 052	7 512	140	16 723	22 850	268 409	210	902	70	11 021	4 999	1 716	18	5	0	44 314	23	9 179	1 215	1 315	2 054	3 351	3 956	568 683	
Germany	33 562	16 337	59	0	0	36 947	55 811	154	11 013	6 957	0	42	3 941	161	58	3 550	2 690	50	0	87 671	22 830	10	1 943	314	12	145	10 979	1 445	296 679	
France	7 026	5 441	214	0	0	39 070	1	0	0	31 425	0	9 624	0	0	35 438	1 196	3 722	47	0	1 958	12 659	3 618	28 592	4 016	4	105 608	0	2 422	292 081	
Spain	0	4 980	4	91	0	886	0	0	0	22 833	1 648	0	0	0	1 683	79	60	1	12	104	561	91 446	390	0	0	11 466	5	136 246	0	
Ireland	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	95 178	95 179	
Italy	773	105	1 377	4 506	0	2 562	2	56	0	36 417	11 620	1 387	151	0	0	0	0	1	1 161	56	1 212	3 837	5 339	1 864	3 739	606	3	1 290	78 063	
UK	0	2 212	58	0	0	2 041	1	0	0	40 898	3 048	0	220	7 534	1 565	21	0	0	0	694	1 866	42	19	3 090	0	278	188	0	63 774	
Portugal	0	0	0	0	0	0	0	0	0	21	1	0	0	0	669	0	0	10	0	0	0	0	0	0	0	13 940	0	42	14 682	
Denmark	0	0	0	0	0	0	0	0	0	4	868	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10 462	0	11 334	0	
Austria	0	0	0	259	0	20	0	0	0	20	634	0	7 804	1	1	0	0	0	0	165	7	0	0	0	1 520	0	0	0	10 431	
Greece	0	2 438	0	1 816	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	5 334	0	0	0	0	50	9 640	
Sweden	0	0	0	0	0	0	7 138	24	142	356	1 145	0	0	0	55	0	0	0	0	0	0	11	0	0	0	1	0	0	8 872	
Finland	0	0	0	0	0	0	0	6 984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	134	0	7 118	
NMS, incl.	297	66	3 406	26 111	0	9 880	1	9 455	54	122	2 453	396	14 998	126	2 167	15 187	8 337	0	47	0	5 055	0	34 629	43 697	1 232	61	0	4	177 780	
Czech Rep.	12	66	19	0	0	0	0	0	0	21	138	0	1 375	0	20	312	268	0	0	0	3 187	0	16 495	41 325	408	0	0	0	63 645	
Poland	220	0	1 526	0	0	7 991	0	38	0	100	1 998	0	318	0	319	500	3 726	0	0	0	0	0	14 672	2 059	0	0	0	4	33 471	
Slovenia	59	0	1 706	26 092	0	135	0	0	0	0	0	0	1 054	0	1 828	0	0	0	0	0	403	0	1 577	302	0	61	0	0	33 218	
Lithuania	0	0	0	0	0	477	0	2 325	0	0	0	0	0	0	14 375	0	0	0	0	0	506	0	0	0	0	0	0	0	17 682	
Slovakia	3	0	0	18	0	787	0	0	0	0	0	0	12 251	0	0	0	0	0	0	0	105	0	0	0	0	0	0	0	13 164	
Latvia	0	0	0	0	0	0	0	7 092	0	24	0	0	0	0	0	4 343	0	0	0	0	705	0	0	0	0	0	0	0	12 165	
Hungary	2	0	0	0	0	41	0	0	0	0	292	0	0	0	0	0	0	0	0	0	0	1 110	1	0	0	0	0	0	1 446	
Croatia	0	0	0	0	0	392	0	0	0	0	0	0	0	0	0	0	0	0	0	0	149	0	0	11	824	0	0	1 376		
Bulgaria	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	775	0	0	0	0	0	800	
Cyprus	1	0	0	0	0	0	0	0	0	0	0	371	0	1	1	0	0	0	47	0	0	0	0	0	0	0	0	0	420	
Romania	0	0	156	0	0	57	0	0	0	0	1	0	0	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	339	
Extra-EU	1 079	1 187 085	26 575	22 613	3 472	22	7 051	0	82 241	270 126	655 604	149 691	0	71 539	657 625	20 27 366	0	7 460	635 633	156 238	63 691	2 649	0	64 416	157 733	149 755	1 031 053	5 430 738		
MFN, incl.	1 079	852 129	26 575	22 613	3 472	21	592	0	82 241	4 462	635 660	149 691	0	47 885	626 618	20 27 346	0	7 460	626 387	156 238	63 168	2 649	0	64 416	134 930	86 587	641 298	4 263 535		
Ecuador	77	184 284	24 502	22 613	3 183	21	0	0	18 540	1 368	365 824	114 242	0	513	143 889	0	8 498	0	2 822	96 719	115 413	4 730	1 452	0	37 653	1 576	40 235	110 861	1 299 015	
Colombia	951	443 682	1 642	0	269	0	258	0	0	2 050	65 238	24 552	0	0	206 179	20	94	0	3 652	150 159	19 109	15 151	1 135	0	16 829	38 456	4 488	294 951	1 288 864	
Costa Rica	0	168 547	411	0	20	0	333	0	62 763	667	133 690	5 312	0	41 109	243 181	0	18 732	0	736	134 422	559	40 540	0	0	8 644	67 772	39 451	159 152	1 126 041	
Panama	0	20	0	0	0	0	0	0	918	0	7 693	1 334	0	1 028	1 400	0	0	0	153 867	0	62	0	0	0	0	2 413	31 395	200 129	0	
Peru	51	46 194	0	0	0	0	0	0	372	37 655	0	0	0	304	0	0	0	0	29 006	0	0	0	0	0	0	0	0	1 756	115 338	
Guatemala	0	5 371	0	0	0	0	0	0	0	12 026	4 030	0	646	27 915	0	0	0	0	33 680	1 089	0	22	0	0	619	0	13 011	98 410	0	
Mexico	0	1 965	0	0	0	0	0	0	20	0	2 483	20	0	3 305	0	22	0	233	18 668	0	2 685	40	0	41	21 936	0	21 000	72 417	0	
Nicaragua	0	1 749	0	0	0	0	0	0	0	9 543	0	0	0	0	0	0	0	0	913	20 067	0	0	0	0	0	0	0	2 186	34 458	
Brazil	0	262	0	0	0	0	0	0	0	0	864	0	0	429	0	0	0	0	8 926	0	1	0	0	0	4 572	0	5 961	21 014	0	
ACP, incl.	0	334 957	0	0	0	1	6 460	0	0	265 664	19 945	0	0	23 655	31 007	0	20	0	0	9 246	0	523	0	0	0	22 802	63 168	389 756	1 167 203	
Africa	0	236 680	0	0	0	1	0	0	0	256 283	10 511	0	0	0	22 727	0	0	0	0	46	0	523	0	0	0	16 872	0	119 621	663 264	0
Côte d'Ivoire	0	99 745	0	0	0	0	0	0	0	136 468	10 440	0	0	845	0	0	0	0	40	0	512	0	0	0	16 872	0	43 247	308 169	0	

Source: Eurostat

Producer country file

The banana in Colombia

Colombia is one of the major players in the international banana trade as the world no.5 exporter and no. 2 supplier to the European market. Despite pedoclimatic assets and great cultivation experience, the country has lost some competitiveness in recent years, especially because of a chronic lack of investment. However, the restoration at last of stabilised political climate and the return to a more favourable peso/dollar exchange rate seems to have reinvigorated investment, both from the public authorities and from private operators.



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location

The banana planted area, covering nearly 48 000 ha, is packed into two zones on the Caribbean coast. The Urabá region, situated in the westernmost part of this coast, on the border with Panama, is the country's main production centre (north-west tip of Antioquia department). It contains nearly 34 000 ha plantations, concentrated between the districts of Turbo in the north and Chigorodó in the south, with Apartadó and Carepa in between. The mean rainfall of 2 650 mm increases as you go from north to south (from 2 000 mm on the coast to 4 000 mm from the south of Apartadó). Its distribution is unequal, with a distinct shortage from January to March and a very wet period from September to November (peak in October). The mean temperature is 24°C. The production facilities are medium to large in size, with plantations of more than 50 ha representing approximately 90 % of surface areas. The other main centre is also on the coast, but further east. The 14 000 ha in this zone is divided either side of the Sierra Nevada de Santa Marta,

primarily in its western part (Magdalena department, from Fundación to Ciénaga) and in the east (La Guajira department). The climate is distinct from that of the Urabá region, with higher temperatures (from 28 to 30°C on average, with minima dropping as far as 21°C), and considerably less abundant rainfall (1 400 mm, received mainly from August to early December, and to a lesser degree from mid-April to late June). Furthermore, the production facilities are heterogeneous in size, ranging from very small (approximately 500 smallholdings of less than 5 ha) to large (plantations of more than 50 ha representing 60 % of surface areas). These two zones have a flat topography which facilitates cultivation and cluster harvesting. They also enjoy good quality soils, though they are generally somewhat clayey, with loams a bit more abundant in the Magdalena region. The effects of erosion are limited, though compaction problems are not uncommon in the Urabá zone, a region characterised by intensive and high-tech production systems.



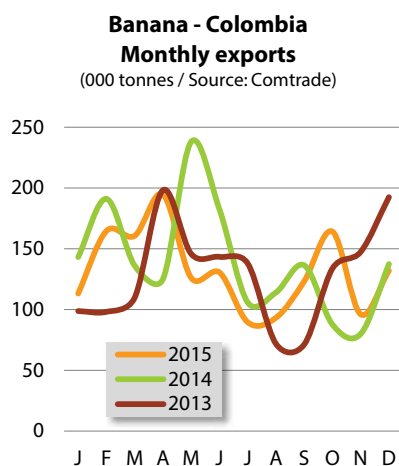
History

Export banana production goes back more than a century, with a major centre set up in the Magdalena department in 1885. It made great strides forward, driven by the United Fruit Company (UFC, later Chiquita), until a serious social crisis in the early 1930s, which was followed by a period of mothballing. The Colombian banana industry saw a renewal in the early 1960s with the migration of UFC's activities to the Urabá zone, targeted for its availability of untouched fertile land, its geographic location protecting it from hurricanes and ensuring rapid service to the US market. After switching to Cavendish in the early 1970s because of Panama disease, the industry made significant progress until the early 2000s, despite an extremely unstable political climate in the country from the mid-1980s. This dynamic was driven first of all by Frutera de Sevilla (a local subsidiary of UFC), and then by local groups (Uniban in the early 1970s, and then Banacol and Proban in the early 1980s), which became independent in terms of both production and exports from 1983. The planting dynamic has been practically zero since the mid-2000s. The sector is one of the country's biggest providers of foreign currency (836 million USD in 2015), though it remains a long way behind the flowers sector (1.3 billion USD) and even further behind the coffee sector (2.5 billion USD). Representing 40 to 50 % of the agricultural GDP of the departments of Antioquia and Magdalena, it currently generates approximately 40 000 direct jobs and 120 000 indirect jobs.



Production

The stagnation in surface areas and the downward trend in productivity, which went from 2 200 boxes/ha in the late 2000s to 1 850 boxes/ha in 2015, express the difficulties facing the sector. First of all, the industry is suffering from a lack of investment and technical support over the long term, due to an extremely unstable political climate until 2006, followed by a decade of low profitability (difficult world market and highly unfavourable peso/USD exchange rate until 2014). In addition, production costs are on the up, especially because of the resurgence of black sigatoka. Finally, the climate conditions are increasingly unstable and restrictive, with increasingly intense periods of drought, excessive rains or strong winds. In 2014, several thousands of hectares of banana plantations were destroyed by a tornado in the Urabá region. These climate events highlight the country's shortcomings, especially in terms of irrigation and drainage in the Urabá region (just 25 % of plantations irrigated). The sector seems to have begun to bounce back, as demonstrated by the improvement in productivity since early 2016. The economic context has now brightened, with a favourable exchange rate since 2015 and more limited inflation, not to mention the political and social stabilisation which now seems set to last. Investment programmes are underway, mainly led by the profession (remediation of 4 000 ha of unproductive land).



Organisation

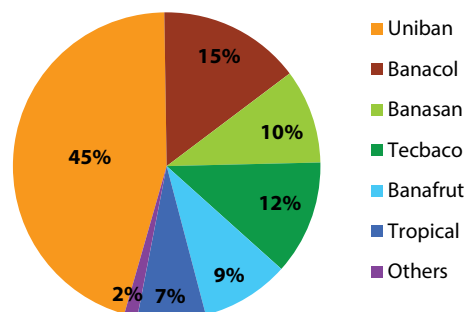
The production network is based on approximately 1 100 farms, highly variable in size depending on the region: the majority comprise more than 50 ha in the Urabá zone, yet just 1 to 5 ha in the Magdalena-La Guajira zone. The export sector is highly concentrated, and mainly comprises local players, with more than 85 % of volumes in the hands of the six biggest trading companies. Uniban is by far the main operator (45 % of volumes). It is followed by five entities with a market share of between 7 and 15 % (Banacol, Tecbaco, Banasan, Banafruit and Tropical). These exporters are as a general rule contractually bound, sometimes over numerous years, to the downstream segment, especially the big multinational groups. The sector is represented by two associations: Augura and Asbama. Augura, founded in 1963, is the main one. Its affiliates are primarily based in the Urabá region, and account for 75 % of surface areas and 60 % of exports. It coordinates various banana region development programmes, conducts alongside Cenibanano research into optimising banana cultivation, organises training and supports the sector in politics. For its part, Asbama was founded in 1996 and represents a large proportion of the producers from the departments of La Guajira and Magdalena.

Exports

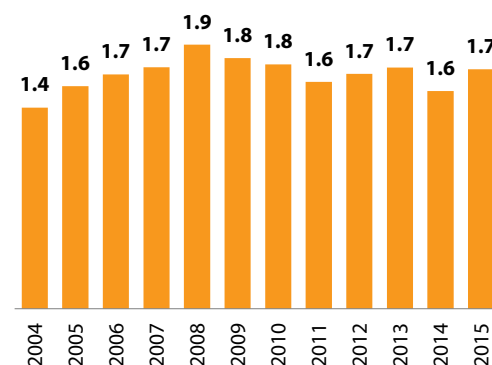
Cavendish exports have fluctuated between 1.5 and 1.7 million tonnes for nearly a decade. A growing proportion of the volumes is aimed at the EU-28, which has long been the number one market for the Colombian banana (market share around 80 % in 2015, as opposed to approximately 60 % in the early 2000s). The main entry points are the northern ports (Belgium and Netherlands), Italy and the United Kingdom. Conversely, while the United States remains the number two outlet, its volume share has tended to decrease (from 40 % in the early 2000s to less than 20 % in 2015) because of increased competition from Guatemala. Shipments to the rest of the world are marginal, accounting for barely 1 to 2 % of total exports. They were mainly aimed at Russia until the rouble's slump in 2014, and are now shipped to Turkey. Approximately three-quarters of export volumes come from the Urabá zone, and the remainder from Magdalena-La Guajira.

Colombia is the world number two exporter of Fairtrade bananas. Approximately 130 000 t of conventional Fairtrade bananas were exported in 2015, for cultivated surfaces of around 5 000 ha. The country also plays an important role on the organic market, with approximately 3 000 ha dedicated to organic bananas, i.e. the whole of the La Guajira surface areas, in the Riohacha and Dibulla zones, and some of those in Magdalena.

Banana - Colombia - Main exporters in 2015
(Source: Augura)

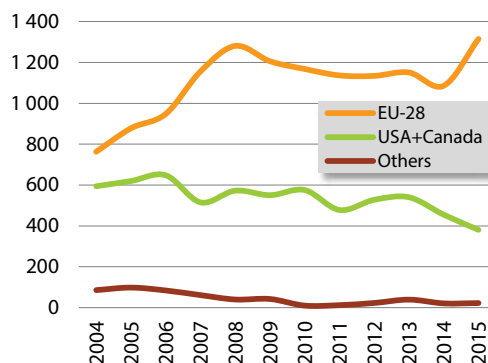


Banana - Colombia - Exports
(million tonnes)



Methodological note: for EU-28, USA and Canada = imports (source: national Customs - dessert bananas); for other destinations = exports (source: COMTRADE - code 0803 dessert bananas and plantain)

Banana - Colombia - Exports by destination (000 tonnes)



Methodological note: for EU-28, USA and Canada = imports (source: national Customs - dessert bananas); for other destinations = exports (source: COMTRADE - code 0803 dessert bananas and plantain)

logistics

The volumes from the Magdalena and La Guajira zones are shipped by road to the port of Santa Marta, less than 100 km from the plantations. Approximately 30 to 40 % of exports leave from this port, served both by dedicated ships and regular lines run by big shipping companies. The logistics are more complex for produce from the Urabá region, from where the majority of export volumes originate. The palletised or containerised fruit is transported by road to the Turbo shipping terminal, situated in the Gulf of Urabá approximately 50 km from the plantations. It is then loaded onto barges, and then transhipped onto conventional ships moored near the coast where the wind conditions are better. A new port enabling merchant shipping to dock is at the planning stage (Puerto Antioquia, in the south-east near the city of Nueva Colonia), as part of a national infrastructures improvement project. The work should start within three years, with a 400 million USD budget for the first phase. The Colombian banana industry possesses a major asset in terms of logistics, in that it can serve the US East Coast and Europe without having to take the Panama Canal.



BANANA — COLOMBIA — SEA FREIGHT

	Port of arrival	Transit time
USA	Baltimore	10 days
	Charleston	8-16 days
	Houston	10 days
	Miami	6 days (direct)
	New York	10-14 days
	Port Everglades	5 days (direct)
	Savannah	10 days
EU	Antwerp	13-21 days
	Hamburg	15-22 days



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Banana

Consumption in the EU

Eastern Europe playing catch-up

It is rather a complex task to describe banana consumption in each of the EU Member States. Since the depressing quality for the observer of this big single market lies precisely in its oneness. Flows between States are not always very accurate. While we know precisely what is imported from third countries and what is produced within the EU, intra-Community trade is more difficult to grasp.

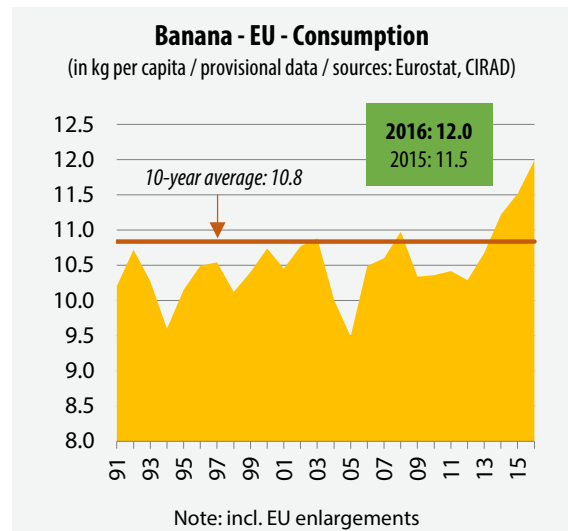
Once we bear this in mind, we can study the situations with a sufficient degree of perspective. Nonetheless the exercise is an important one. On a market that has seen 3 to 5 % annual growth for several years, macro-analysis is insufficient to understand the route of this surge of volumes.

The first lesson we can draw from this study is the big consumption gap between Sweden, with more than 16 kg/capita/year, and Romania, with less than 4 kg. These figures are calculated over a ten-year period and statistically reprocessed to smooth the excessive inter-annual deviations. With this calculation, mean consumption for the EU-28 is 10.8 kg.

For 2016, taking the reservations into account, Malta, Finland and Sweden emerge as massive banana consumers. Romania, Bulgaria and Hungary are at the bottom of the table. The deviations around the European mean (12 kg) are a huge + 8 to - 8 kg.

So it is not absurd to conclude that, as elsewhere, there is a consumption catch-up phenomenon in the New Member States (NMS). A good part of the extra 900 000 t consumed since 2012 has been bound for these countries. It would be self-deceiving to think to quantify this consumption surplus, so tricky are the figures to handle. The fact remains that markets such as the Czech Republic, Bulgaria, the Baltic States, Croatia, etc., have seen their consumption level increase. On the traditional, i.e. mature markets, things are dead calm for France, Germany and the United Kingdom. Under joint pressure from its own production and a surge in imports, Spanish consumption leapt up by 1.7 kg in 2016: a figure that seems exaggerated, and which will need to be confirmed in the coming years.

In any case, consumption is moving in the right direction within the EU. With an additional 500 g per capita, the EU set a new record of 12 kg. This is a remarkable dynamic for a fruit which enjoys only very occasional marketing actions. We need to pray that this lasts a little longer, since the financial balance of the European market is at stake ■



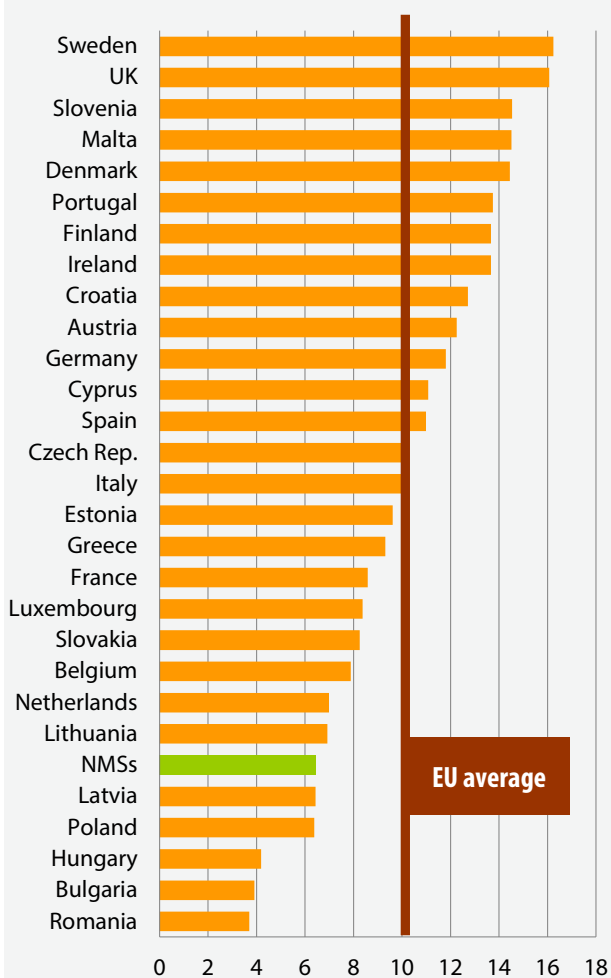


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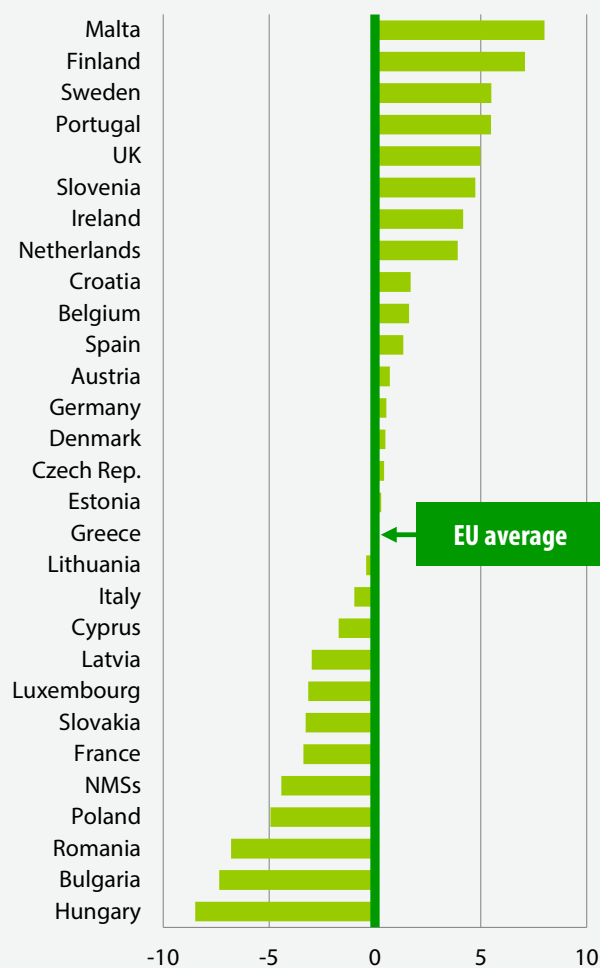


Banana - EU - Consumption - Estimate using a reduced average (40 %) for the period 2007-2016
(kg/capita/year)



Note: the results are uncertain for some Member States
Source: Cirad-Fruitrop / Experimental work

Banana - EU - Consumption in 2016
Over and under-consuming Member States
(kg/capita/year)



Note: the results are uncertain for some Member States
Source: Cirad-Fruitrop / Experimental work

Banana

European market supply

Record after record

For the 4th time in a row, banana consumption in the EU-28 set a new record high. With more than 6.1 million tonnes in 2016, this was the first time that the symbolic 6-million tonnes mark has been broken. The initial data for 2017 (January and February) show that the positive trend is intact. There has actually been a perceptible acceleration over a twelve-month period (March 2016 to February 2017), with a cumulative consumption of 6 154 000 t. If things go on as they are, 2017 should be another record year, with the European market seeing a growth rate of more than 5 %! We have not yet reached that point, although there is not far to go. Since in 2016 the market registered + 4.5 %, after + 3 % between 2014 and 2015, and + 5.6 % between 2013 and 2014. And make no mistake, these are growth rates with constant EU scope. In short, all is rosy in the banana world.

Yet who gains from this dynamic? Actually, everyone! The indexes for all three main supply sources rose between 2012 and 2016. The dollar and ACP origins went from an index of 100 to 120 and 119 respectively. Even European production emerged a winner with an index of 107 in 2016. Yet not all suppliers are involved in the European feast. Indeed, while the cake is swelling, there are fewer and fewer guests at the table. For the dollar origins, 99 % of imports are provided by just seven suppliers. For the ACPs, six origins hold a 99 % market share. If we add to these thirteen suppliers the production of four European outer regions, we round off the European market supply scene.

It is the ACPs which have seen the biggest change in recent years, with activity concentrating in one region, Africa (Côte d'Ivoire, Cameroon and Ghana) and one other origin, the Dominican Republic. Belize and Suriname, despite transient difficulties, top up the ACP supply. Down the drain have gone Dominica, St. Vincent and even Mozambique (despite being a newcomer), with Saint Lucia struggling to survive. Besides the number of countries, there has also been a big reduction in the number of producers over the past twenty years. There is still a network of small producers in the Dominican Republic, but there too things seem to be shifting. In Africa, small producers have long since disappeared from the banana growing landscape. While the number of operators is increasing, for example in Côte d'Ivoire, it is thanks to the establishment of newly-arrived industrial operators, and over the coming years, the launch of the "small planters" strategy stipulated by the EU in the banana industry assistance programme (BAM system), but

which is very much reliant (technically and commercially) on historic operators.

For the dollar origins, there was no change for the leading trio (Ecuador, Colombia and Costa Rica), with these origins adjusting their volumes according to their favoured export markets. Colombia, for example, opted to export for the vast majority to the EU (83 % of its total exports in 2016). Costa Rica had an exceptional year in both the EU (+ 19 % by volume from 2015) and the United States/Canada (+ 21 %). This origin is responsible for nearly the entire surge in volumes from non-ACP third countries.

It was among the secondary origins that things shifted, constantly strengthening their positions. Peru, on the organic and Fairtrade slot, increased its presence by 43 % between 2012 and 2016, to 115 000 t. Mexico made a remarkable breakthrough to reach 72 500 t, i.e. + 254 % since 2012. Yet Guatemala wins the big prize: practically absent from the European market in 2012, it neared the 100 000-t mark in 2016, with exports setting records every month. Finally, Panama saw some ups and downs yet retained its place as the no. 4 dollar supplier. The future seems promising for this country, going by the agreement that Del Monte has just signed with the Panamanian authorities to revitalise the local industry. It is predicting a planting rate of 900 ha per year for a total, declared in December 2016, of 5 800 ha, i.e. double the current surface area owned by Chiquita.

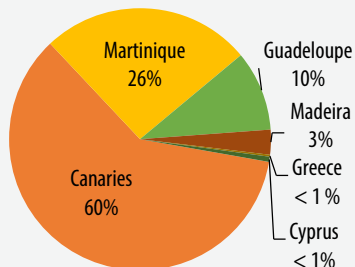
European production meanwhile is organised around six regions, though only four really count: the Canaries, Martinique, Guadeloupe and Madeira. The two French regions dance to the tune of the climate vagaries. Cyclone Matthew in September 2016 unfortunately stopped dead the rebuilding of Martinique's potential (around 200 000 t). Guadeloupe continued its fine rise (69 000 t in 2016), and is retaining its medium-term target of 80 000 to 100 000 t. The Canaries are driving the European group, with a staggering figure of 417 000 t traded in 2016, a level never achieved since 2004. Finally, Madeira was also back to its highest levels since 2004, with a volume of 21 000 t. In total, the European supply was up by 3 % in 2016 to 693 000 t, a figure never achieved since 2004.

Overall, the market shares have seen no big shake-up. Dollar bananas fell for the first time since 2011 to 69.6 % (- 0.6 %), the ACP gained 0.7 % to 19.1 %, and European production stabilised at 11.3 % (- 0.1 %) ■

Banana - EU - Community sources

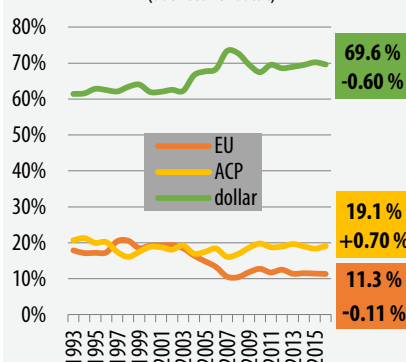
Total 2016: 692 954 tonnes

(source: European Commission)



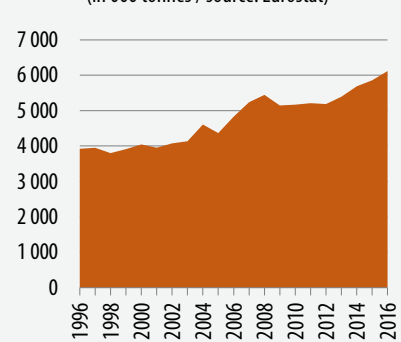
Banana - EU Market shares by source

(source: Eurostat)



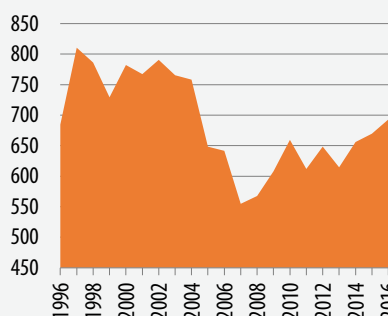
Banana - EU - Net supply

(in 000 tonnes / source: Eurostat)



Banana - EU - Community sources

(in 000 tonnes / source: European Commission)



Banana — EU — European production

in tonnes	2013	2014	2015	2016	2016/2015 difference	
					in %	in tonnes
Canaries	360 981	364 419	381 827	417 176	+ 9 %	+ 35 349
Martinique	159 015	193 201	199 241	179 888	- 10 %	- 19 353
Guadeloupe	71 511	73 592	63 781	68 608	+ 8 %	+ 4 827
Madeira	15 775	18 649	18 645	21 167	+ 14 %	+ 2 522
Cyprus	5 082	3 952	4 384	4 382	0 %	- 2
Greece	2 200	2 167	1 795	1 733	- 3 %	- 62
Total	614 564	655 980	669 673	692 954	+ 3 %	+ 23 281

Source: Eurostat

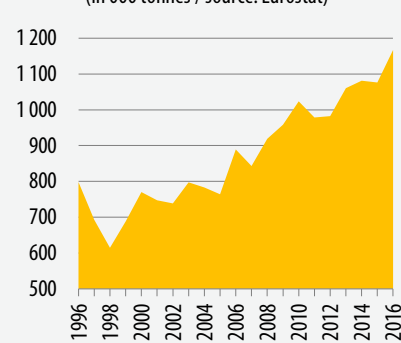
Banana — EU — Imports from ACP sources

in tonnes	2013	2014	2015	2016	2016/2015 difference	
					in %	in tonnes
Dom. Rep.	322 839	342 016	326 587	374 942	15%	48 355
Côte d'Ivoire	252 165	252 766	254 218	308 169	21%	53 952
Cameroon	250 334	257 152	278 247	297 058	7%	18 810
Belize	96 763	100 707	98 969	71 741	-28%	-27 228
Ghana	42 729	46 427	50 990	57 856	13%	6 866
Suriname	80 956	72 593	58 583	49 739	-15%	-8 845
St Lucia	12 367	8 874	8 339	7 364	-12%	-975
Total	1 060 467	1 081 268	1 076 315	1 167 203	8%	90 887

Source: Eurostat

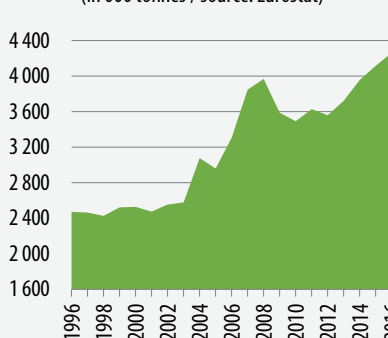
Banana - EU - Imports from ACP sources

(in 000 tonnes / source: Eurostat)



Banana - EU - Imports from dollar sources

(in 000 tonnes / source: Eurostat)



Banana — EU — Imports from dollar sources

in tonnes	2013	2014	2015	2016	2016/2015 difference	
					in %	in tonnes
Ecuador	1 316 685	1 474 454	1 361 756	1 299 015	- 5 %	- 62 741
Colombia	1 150 980	1 086 273	1 315 399	1 288 864	- 2 %	- 26 535
Costa Rica	839 804	940 393	947 760	1 126 041	+ 19 %	+ 178 281
Panama	207 855	224 879	207 274	200 129	- 3 %	- 7 145
Peru	112 396	96 650	102 326	115 338	+ 13 %	+ 13 012
Guatemala	13 656	29 167	79 024	98 410	+ 25 %	+ 19 385
Mexico	53 971	70 784	69 102	72 417	+ 5 %	+ 3 314
Nicaragua	-	-	9 326	34 458	+ 269 %	+ 25 132
Total	3 746 853	3 956 439	4 116 432	4 263 535	+ 4 %	+ 147 103

Source: Eurostat

Banana

French market

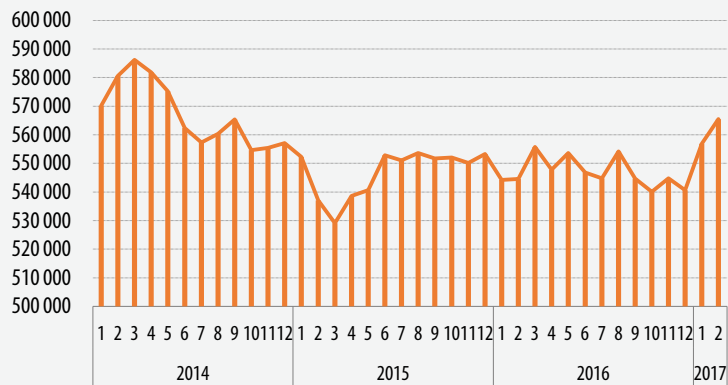
Softly does it

Grounded for the past three years, the French market again failed to take off in 2016. Consumption was down 2 % from 2015, back to 541 000 tonnes. Will 2017 be the year of renewal? The highly favourable consumption trend for the first two months (+ 21 %) would seem to support this theory ■

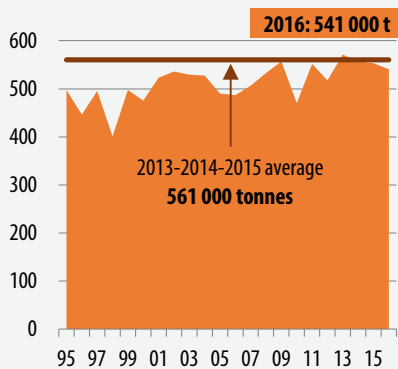


© Régis Domergue

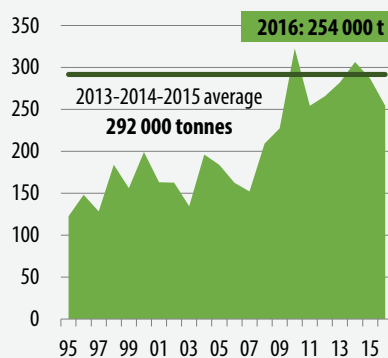
Banana - Metropolitan France - Net supply over a 12-month sliding basis
(in tonnes / source: CIRAD-FruiTrop)



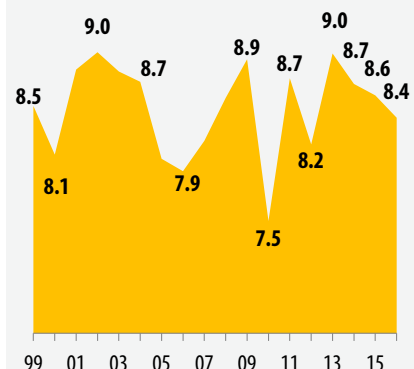
Banana - Metropolitan France Net supply
(in 000 tonnes / source: Customs)



Banana - Metropolitan France Re-exports
(in 000 tonnes / source: Customs)



Banana - Metropolitan France Consumption (2016 provisional)
(in kg per capita / sources: Customs, INSEE)



Banana — France — Supply

in tonnes	2010	2011	2012	2013	2014	2015	2016
Supply, of which	792 632	805 979	783 132	853 336	863 396	839 935	794 778
French West Indies, of which	243 278	234 904	251 165	232 356	265 001	260 124	235 248
Guadeloupe	42 215	58 634	65 998	71 182	72 893	62 148	66 742
Martinique	201 063	176 270	185 126	161 082	192 099	197 975	168 502
ACP	405 782	397 947	405 913	440 655	457 130	443 103	396 949
Dollar	48 716	76 533	63 756	86 664	74 734	97 875	106 707
Through an MS*	94 855	96 595	62 297	93 661	66 531	38 834	55 874
Exports to an MS or outside EU	322 479	254 094	265 374	282 662	306 358	286 643	254 150
Net supply	470 153	551 885	517 759	570 674	557 038	553 292	540 629

*MS: Member State / Source: Customs / Processed by CIRAD-FruiTrop



WANITA
PREMIUM BANANAS
CÔTE D'IVOIRE



Global Gap / Rainforest Alliance

BANANAS & TROPICAL FRUITS FROM IVORY COAST
PRODUCER - INDEPENDENT EXPORTER

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Banana US market

The Sleeping Beauty

This market, after driving world growth since at least 2010, came to a standstill in 2016. With 4 038 000 t, it is to the tonne the same as in 2014. On top of the bananas on the market still to be consumed there are some 555 000 t in transit toward Canada. While since 2013, the supply has stagnated slightly above 4 million tonnes, consumption per capita has dropped back to 12.5 kg in 2016, i.e. 200 g less (- 2 %).

By dint of running like clockwork, the US market has popped a spring. The consumption dynamic does not mix well with overly-stringent scheduling of import quantities. Defending its market share, or even coordination between players, has helped maintain a good value level at the intermediate market stages, yet to all appearances, has not benefitted consumption. So to put it simply, it is a compromise made by operators between less margin, though for a bigger volume, or more margin for a stable volume, as is currently the case. The initial data for 2017 confirmed this trend on a 4-million tonnes market. We should reiterate, in the meantime, the European market has grown by 3 to 5 % per year.

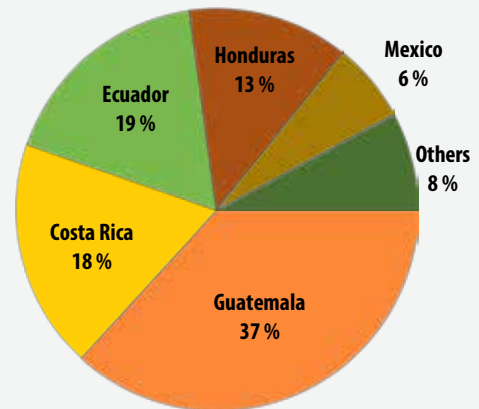
In terms of suppliers, things could not be simpler: it is rather a case of Costa Rica against the rest of the world. The Central American country has been a huge hit, just as in the EU. Exports to the USA/Canada zone were up by 21 %, to just in excess of the 800 000-t mark after a lamentable 2015, though a very long way off their historic level of 1.4 million tonnes in 2000. The other suppliers have cut sail, either abruptly like Colombia which has deliberately chosen to switch to the EU (- 19 %), or more moderately such as Ecuador (- 1 %), Guatemala (- 2 %) or even Honduras and Mexico (- 5 %). Note that in the case of Guatemala, it is the first time since 2009 that its exports to the United States/Canada have fallen.

The US Customs allow us to take the flows analysis a little further. Since 2014, they have enabled us to identify organic labelled bananas. Unsurprisingly, this segment is on the up, with a market share of 8 % in 2016, as opposed to 7 % in 2015 and 5 % in 2014. Some 370 000 t of organic bananas are marketed in North America. They come mainly from Ecuador (55 %), with Peru, Colombia and Mexico topping up the supply.

In terms of supply calendar, the consumption of these two big countries (the United States and Canada) is relatively minor, with consumption in the first half slightly greater than in the second. A recovery often takes shape after the summer months (in September), while the end and beginning of the year are trough periods ■

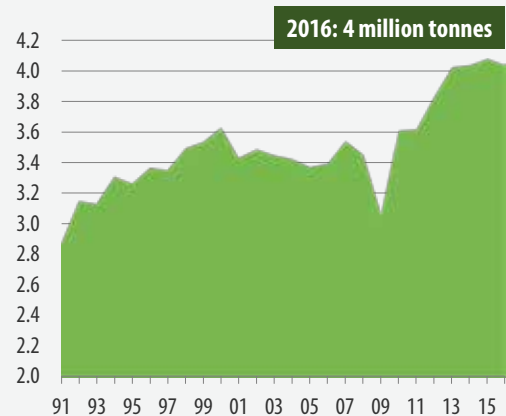
Banana - USA - Imports in 2016

(source: national Customs)



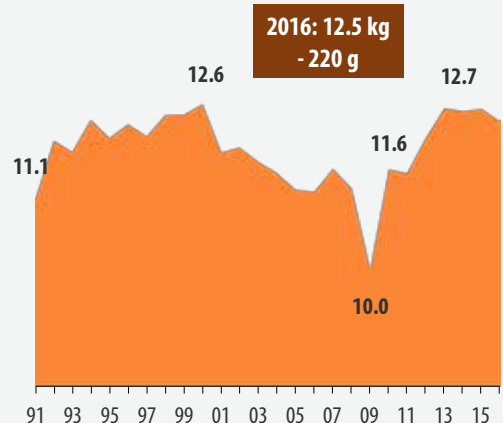
Banana - USA - Net supply

(in million tonnes / source: Customs)



Banana - USA - Consumption

(in kg per capita / source: Customs, 2016 provisional)





Control the ripening progression of bananas during shipping, distribution and display.

The **RipeLock™ Quality System** is a revolutionary fruit quality management system specifically designed for the banana industry. This innovative system, a combination of a new generation MAP Bag and a special ethylene-control formulation (RipeLock Tabs 2.0), gives you perfect color bananas, every day, and allows you flexible inventory management.

The proven benefits are clearly visible:

- Extended "yellow life" for bananas
- Delayed development and reduced incidence of sugar spots
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- Extended life at retail and better taste for consumers

TRADITIONAL RIPENING



4 days after scheduled delivery to retailer

RIPELOCK™ QUALITY SYSTEM



4 days after scheduled delivery to retailer and removal from RipeLock Bag

The RipeLock Quality System is now registered in Belgium, the Netherlands, France, Italy, Spain, Germany, Austria, Switzerland, Poland, Greece and the United Kingdom. The system also is available in the United States and Canada. For more information on the RipeLock Quality System, visit www.agrofresh.com/ripe-lock-technology or contact our representatives:

Ivan Van Dessel: ivandessel@agrofresh.com, +32 477 26 23 05

Jean-Christophe Leterme: jleterme@agrofresh.com, +33 6 74416895

Banana

Russian market

A nice surprise

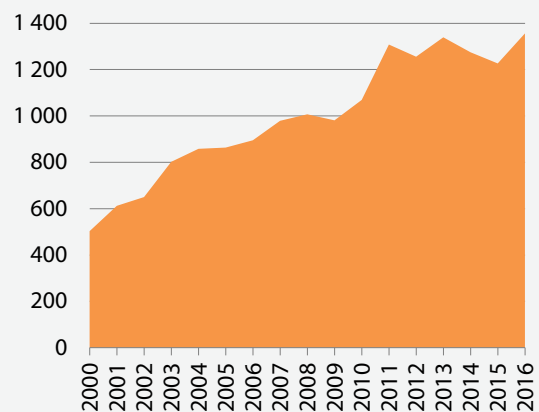
A wall has fallen, with the Russian market importing more than 1.3 million tonnes in 2016. The rise was a dazzling + 10 %. The extreme vitality of 2016 distinctly contrasts with the extreme apathy of the years 2014 and 2015. The additional 123 000 t drove consumption per capita from all of 8.5 to 9.5 kg/year! Yet in Russia, since anything which is done can be undone just as quickly, we must remain cautious about the durability of the increase. The initial figures for 2017 (Q1) nonetheless provide grounds for optimism. Imports were up by 3 % from last year, and 14 % on the three-year average. Especially since Russian procurement comprises nearly 100 % Ecuadorian production, the spot banana with a high disruption potential for the European markets.

The factors which may continue to fuel this excellent trend will above all be macro-economic and political: exchange rate of the rouble against the dollar, increase in oil sales revenue, emerging from recession, Russian embargo on European produce, sanctions imposed by the EU, etc. According to the rating agencies, Russia should see positive growth in 2017, but low. In this context the banana has a major asset: it is the cheapest fruit on the shelf, and that is not about to change.

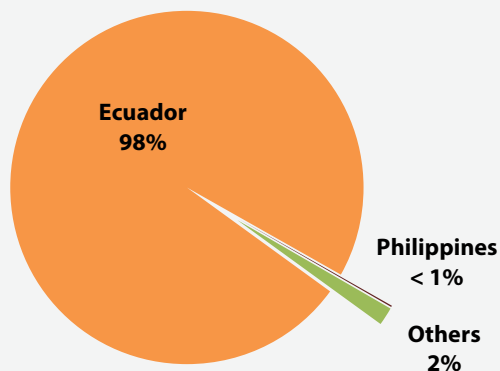
In the long term, and as in Japan, it is depopulation that should have a very high impact. Certain demographic studies estimate that the Russian population should drop to 100 million in 2050, i.e. nearly 50 million fewer than at present ■



Banana - Russia - Annual imports
(in 000 tonnes / source: Customs)

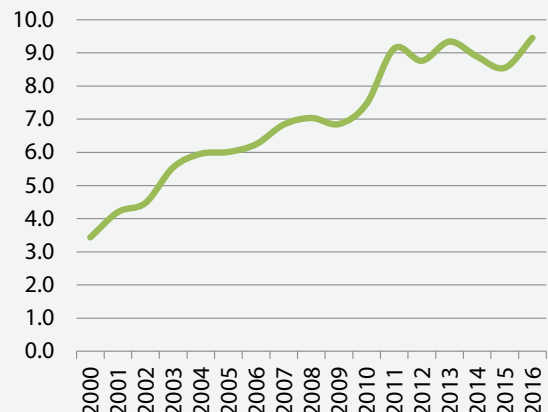


Banana - Russia - Imports by sources in 2016
(source: Customs)



Banana - Russia - Consumption

(in kg per capita / sources: Comtrade, Eurostat, CIRAD-Fruitrop)



Banana

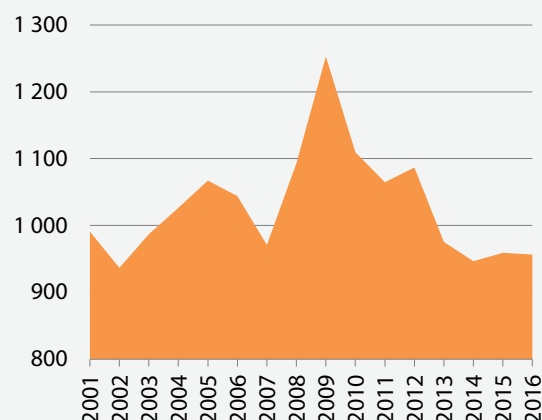
Japanese market

Desperation

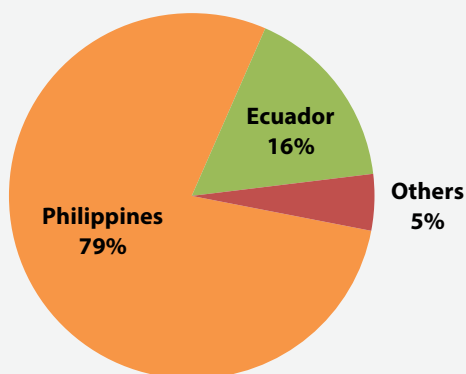
While there remains great uncertainty over the development of certain markets, the same cannot be said for Japan. Banana consumption is and will remain flat. However it is a substantial market, absorbing nearly one million tonnes a year. It is traditionally the Philippines (79 %) which supply Japan's 126 million with bananas. Ecuador has however come back with a vengeance since 2015, to capture in 2016 up to 16 % of the market. The climate vagaries which have hit the Philippines and a steeply rising supply in Ecuador explain this trend, which is reversible. Consumption per capita remains stable at 7.6 kg/year. As in Russia, over the long term the situation should worsen due to the plain fact of depopulation (steeply falling birth rate). By 2048, the Japanese population should fall below the 100-million mark ■



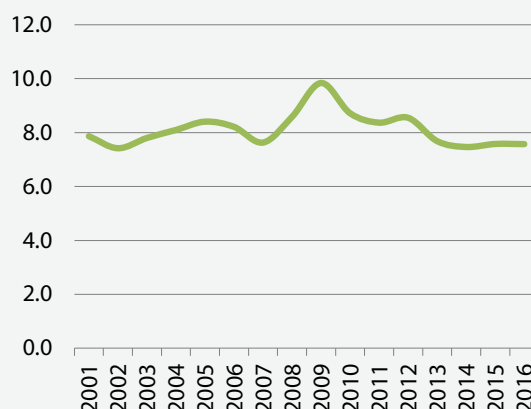
Banana - Japan - Annual imports
(in 000 tonnes / source: Customs)



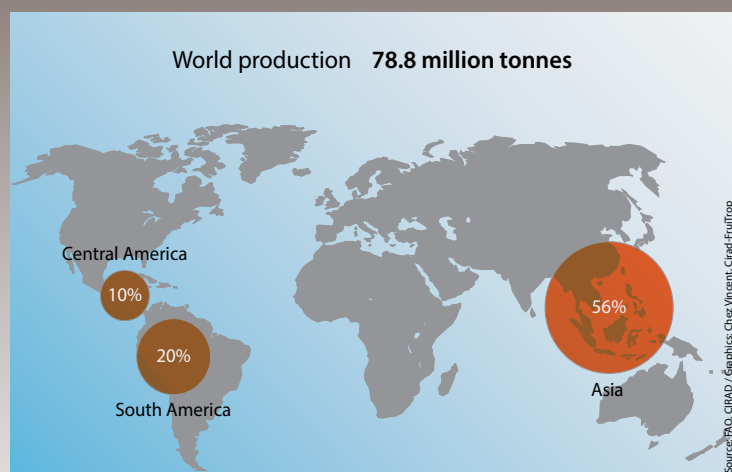
Banana - Japan - Imports by source in 2016
(source: Customs)



Banana - Japan - Consumption
(in kg per capita / source: Comtrade)



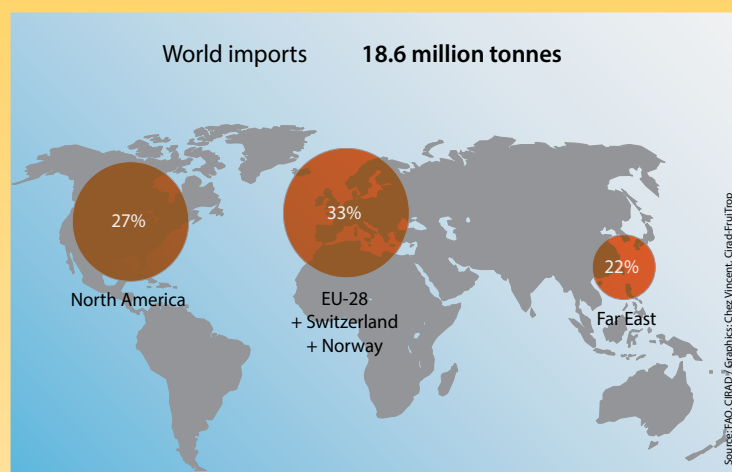
BANANA - Production (2014)



Banana - Top ten producer countries	
in tonnes	2014
India	29 724 000
China	12 091 000
Philippines	8 885 000
Brazil	6 953 000
Indonesia	6 863 000
Ecuador	6 756 000
Guatemala	3 553 000
Angola	3 483 000
Tanzania	3 192 000
Costa Rica	2 194 940

Source: FAO

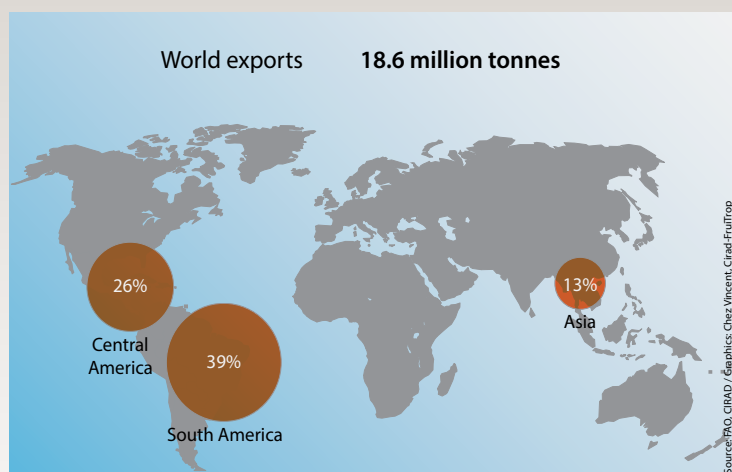
BANANA - Imports (2016)



Banana - Top ten importer countries	
in tonnes	2016
United States	4 593 337
Russia	1 355 990
Belgium	1 187 000
United Kingdom	1 031 000
China	956 054
Japan	956 000
Italy	658 000
Germany	656 000
Spain*	575 176
France*	518 496

*Including island production marketed locally or shipped to the continent / Source: national Customs

BANANA - Exports (2016)



Banana - Top ten exporter countries	
in tonnes	2016
Ecuador	5 974 000
Philippines	3 049 000
Costa Rica	2 365 000
Guatemala	2 165 000
Colombia	1 842 000
Honduras	659 000
Dominican Republic	485 000
Côte d'Ivoire	455 000
Mexico	448 000
Canaries	417 000

Sources: Trademap, professionals

USA - Imports - Main supplier countries						
tonnes	2011	2012	2013	2014	2015	2016
Total	4 122 682	4 349 715	4 556 755	4 577 135	4 609 774	4 593 337
Guatemala	1 333 476	1 458 567	1 612 544	1 671 854	1 725 956	1 690 349
Ecuador	878 971	719 703	763 013	777 762	841 433	849 955
Costa Rica	844 546	848 132	797 971	820 012	667 975	805 503
Honduras	445 223	535 699	603 285	572 944	627 417	594 503
Mexico	148 607	223 294	256 503	259 282	306 168	291 273
Colombia	384 504	440 176	455 509	374 591	314 593	255 274
Peru	23 211	25 900	22 537	40 216	67 662	64 165
Nicaragua	35 585	36 324	35 496	52 041	50 443	39 510
Dom. Rep.	710	2 706	5 848	7 474	8 103	2 602
Panama	27 815	59 195	4 043	853	0	0

Source: US Customs

Canada - Imports - Main supplier countries						
tonnes	2011	2012	2013	2014	2015	2016
Total	506 646	512 845	542 502	555 200	562 221	569 818
Guatemala	147 472	157 569	151 030	171 272	186 085	211 247
Costa Rica	117 796	110 186	126 633	113 986	101 724	122 416
Ecuador	110 422	103 540	123 959	114 599	126 322	102 745
Colombia	93 318	87 788	84 725	80 396	66 289	60 410
Honduras	27 447	40 618	39 331	49 655	49 993	44 735
Mexico	1 975	6 755	9 823	17 429	18 712	19 672
Peru	2 056	2 298	2 792	5 809	9 140	5 714
United States	1 066	572	774	715	1 168	513

Source: Comtrade

Central and South America - Main markets						
tonnes	2011	2012	2013	2014	2015	2016
Total	846 305	639 339	698 154	747 937	813 096	840 486
Argentina	394 881	374 484	392 488	411 294	427 100	433 442
Chile	184 562	134 860	177 135	175 300	199 276	205 512
El Salvador	112 000	49 770	52 110	56 612	60 832	64 761
Honduras	24 085	11 195	5 333	36 107	50 839	63 085
Uruguay	44 760	39 164	44 499	46 525	51 560	45 902
Costa Rica	24 804	9 716	1 181	349	1 370	8 192
Guatemala	5 327	6 822	11 369	11 149	12 529	7 528

Source: Comtrade

European Union - Imports - Main supplier countries						
tonnes	2011	2012	2013	2014	2015	2016
Total	5 270 518	5 190 580	5 421 884	5 693 688	5 862 420	6 123 692
Total EU prod. including	611 841	648 459	614 564	655 980	669 673	692 954
Canaries	346 461	371 013	360 981	364 419	381 827	417 176
Martinique	180 950	184 810	159 015	193 201	199 241	179 888
Guadeloupe	61 516	66 923	71 511	73 592	63 781	68 608
Madeira	15 267	17 742	15 775	18 649	18 645	21 167
Cyprus	5 619	5 746	5 082	3 952	4 384	4 382
Greece	2 028	2 225	2 200	2 167	1 795	1 733
Total dollar prod., incl.	3 680 137	3 559 785	3 746 853	3 956 439	4 116 432	4 263 535
Ecuador	1 377 378	1 343 534	1 316 685	1 474 454	1 361 756	1 299 015
Colombia	1 143 184	1 136 523	1 150 980	1 086 273	1 315 399	1 288 864
Costa Rica	849 251	774 732	839 804	940 393	947 760	1 126 041
Panama	161 124	148 832	207 855	224 879	207 274	200 129
Peru	64 647	80 698	112 396	96 650	102 326	115 338
Guatemala	3 002	5 215	13 656	29 167	79 024	98 410
Mexico	9 760	20 439	53 971	70 784	69 102	72 417
Brazil	52 313	41 103	42 712	28 659	18 232	21 014
Honduras	17 459	5 749	6 472	4 495	4 608	7 651
Total ACP prod., incl.	978 540	982 336	1 060 467	1 081 268	1 076 315	1 167 203
Dom. Rep.	326 851	294 589	322 839	342 016	326 587	374 942
Côte d'Ivoire	224 140	224 943	252 165	252 766	254 218	308 169
Cameroon	235 215	213 868	250 334	257 152	278 247	297 058
Belize	71 064	99 288	96 763	100 707	98 969	71 741
Ghana	47 155	50 691	42 729	46 427	50 990	57 856
Surinam	62 911	83 126	80 956	72 593	58 583	49 739
Saint Lucia	6 159	12 145	12 367	8 874	8 339	7 364
Dominica	4 064	2 268	1 443	538	3	0

Source: EUROSTAT

Other West European countries - Main markets						
tonnes	2011	2012	2013	2014	2015	2016
Total	163 365	157 820	166 329	172 272	175 447	177 060
Switzerland	79 394	77 531	81 626	84 108	87 168	89 847
Norway	78 221	76 803	81 266	84 570	84 613	83 634
Iceland	5 750	3 486	3 437	3 594	3 666	3 579

Source: Comtrade

Russia - Imports - Main supplier countries						
tonnes	2011	2012	2013	2014	2015	2016
Total	1 307 600	1 255 055	1 338 563	1 232 601	1 205 314	1 355 990
Ecuador	1 199 910	1 121 590	1 279 202	1 197 235	1 188 475	1 331 661
Costa Rica	38 566	79 930	16 793	13 247	9 459	15 281
Philippines	35 492	37 631	23 790	17 601	3 350	1 698
Colombia	18 184	13 951	13 655	674	22	415
Vietnam	797	0	0	0	288	452

Source: Comtrade

Ukraine - Imports - Main supplier countries						
tonnes	2011	2012	2013	2014	2015	2016
Total	247 825	242 579	265 648	215 109	145 849	152 834
Ecuador	221 640	203 178	229 881	198 005	133 775	129 438
Costa Rica	12 750	23 720	21 104	15 676	10 209	17 448

Source: Comtrade

Other East European countries - Main markets						
tonnes	2011	2012	2013	2014	2015	2016
Total	186 659	164 768	205 102	201 511	222 096	234 472
Belarus	40 074	58 813	74 459	66 450	71 955	64 410
Serbia	52 435	36 968	48 261	45 949	49 180	58 187
Bosnia	38 014	17 399	24 831	31 156	40 106	44 953
Albania	17 396	17 079	19 886	17 134	20 310	22 809
Macedonia	19 087	16 889	18 482	20 056	20 295	22 629
Moldova	12 193	12 193	11 176	10 800	10 193	10 784
Montenegro	7 460	5 427	8 007	9 966	10 057	10 700

Source: Comtrade

Oceania - Main markets						
tonnes	2011	2012	2013	2014	2015	2016
Total	86 798	63 199	68 889	73 908	84 456	95 479
New Zealand*	86 798	63 199	68 889	73 908	84 456	95 479

* excl. plantain from 2012 onwards / Source: Comtrade

Japan - Imports - Main supplier countries						
tonnes	2011	2012	2013	2014	2015	2016
Total	1 064 125	1 051 420	964 813	946 204	958 800	956 000
Philippines	1 004 098	993 218	897 122	873 894	824 040	751 000
Ecuador	34 282	35 637	41 719	48 070	100 446	158 000
Guatemala	487	769	5 954	7 334	14 729	17 000
Mexico	3 062	2 869	3 032	3 052	4 287	9 000
Peru	8 758	6 310	5 988	4 117	3 568	4 000
Taiwan	8 430	7 826	6 311	4 053	3 236	2 000
Colombia	2 074	2 425	2 682	2 584	2 445	2 000
Thailand	1 989	1 689	1 388	1 429	1 882	2 000
China	709	604	524	481	146	0

Source: Japanese Customs

Other Asian countries - Main markets						
tonnes	2011	2012	2013	2014	2015	2016
Total	1 332 231	1 161 009	921 057	1 666 815	1 617 044	1 435 558
China	906 971	707 425	528 122	1 200 340	1 146 063	956 054
South Korea	352 671	367 673	313 604	359 124	363 466	364 580
Singapore	41 585	44 510	47 567	51 201	54 323	56 107
Nepal	16 722	17 000	7 701	24 313	18 913	21 017
Thailand	10 568	14 667	15 255	9 827	14 324	20 982
Malaysia	2 084	7 812	8 471	21 468	19 955	16 818
Indonesia	1 631	1 922	337	542	0	0

Source: Comtrade

Central Asia - Main markets						
tonnes	2011	2012	2013	2014	2015	2016
Total	130 744	105 716	171 232	144 821	228 636	217 200
Kazakhstan	44 832	39 859	41 305	46 154	48 036	35 534
Afghanistan	27 692	16 094	82 363	64 105	142 518	140 000
Georgia	12 576	12 116	15 190	17 539	15 985	17 125
Armenia	11 026	12 503	9 875	4 357	10 718	11 258
Kyrgyzstan	11 528	10 859	13 545	10 000	8 760	7 045
Azerbaijan	23 090	14 285	8 954	2 666	2 619	6 238

Source: Comtrade

Middle East - Main markets						
tonnes	2011	2012	2013	2014	2015	2016
Total	506 731	585 925	744 937	887 945	830 084	793 903
Iran	306 173	209 431	192 550	205 809	231 806	196 596
Un. Arab Em.	119 441	107 828	168 608	284 665	160 873	164 000
Saudi Arabia	119 762	115 000	114 740	123 665	147 269	150 000
Kuwait	1 828	2 773	84 351	76 806	87 513	99 728
Iraq	25 119	83 368	131 038	139 839	132 007	97 644
Qatar	24 779	28 710	21 966	30 898	37 531	40 000
Bahrain	15 651	19 864	12 624	16 738	22 541	25 000

Source: Comtrade

Africa - Main markets						
tonnes	2011	2012	2013	2014	2015	2016
Total	97 979	112 483	136 825	150 536	119 091	145 287
South Africa	52 510	68 000	96 341	108 192	79 218	97 643
Mali	17 412	16 934	18 000	18 000	18 000	18 000
Senegal	14 318	15 569	17 066	15 567	13 561	17 726
Burkina Faso	2 543	3 067	3 562	3 977	3 537	3 543
Niger	4 577	4 279	354	3 272	2 524	3 538
Mauritania	0	0	0	0	291	2 875
Botswana	6 619	4 634	1 502	1 528	1 960	1 962

Source: Comtrade

Mediterranean - Main markets						
tonnes	2011	2012	2013	2014	2015	2016
Total	869 508	812 500	879 584	853 351	874 648	865 264
Syria	240 000	240 000	240 000	240 000	240 000	240 000
Algeria	245 285	221 668	273 997	263 332	245 652	250 000
Turkey	234 633	225 100	235 188	207 171	218 548	209 356
Tunisia	41 338	5 905	17 545	36 430	60 126	60 000
Jordan	48 263	49 788	42 911	47 298	50 357	50 000
Egypt	25 626	28 391	30 000	26 000	30 000	30 000
Morocco	24 617	28 139	22 468	19 485	18 635	13 908
West Bank	9 746	13 509	17 475	13 635	11 330	12 000

Source: Comtrade

Banana quality defects in the field

Pests



Flower thrips



Red rust thrips



Snail damage



Damage by *Diaprepes* root weevil



Silver rust thrips

Photographs © Luc de Lapeyre, Marc Chillet, Marie-José Rives, Fruidor

Banana quality defects in the field

Physiological defects and other imperfections



Double fruit and deformed fruit



Scarring by a fruit tip



Scarring by a leaf



Scarring by guying cord



Sunscald



Chemical burns

Diseases



Speckling



Red speckling at ripening



Deightonia



Sooty mould on fruit stalk



Cigar-end rot

Photographs © Luc de Lapeyre, Marc Chillet, Marie-José Rives, Fruidor

Banana quality defects at packing

Selection problems and miscellaneous defects



Fruit too thin



Fruit too short



Latex stains



Incomplete flower removal

Bruising



Flexed fruit stalks



**Bruising caused by impact
during packing**

Dehanding problems



Crown cut too short



Pointed crown



Detached crown



Knife wound

Photographs © Luc de Lapeyre, Marc Chillet, Marie-José Rives, Fruidor

Banana quality defects after transport

Ripening problems



'Ship ripe' fruits



Unevenness after ripening

Storage problems



'Green ripe' fruits



Chilling injury

Storage diseases



Latent anthracnose infection



Wound anthracnose



Crown rot



Crown rot

Photographs © Luc de Lapeyre, Marc Chillet, Marie-José Rives, Fruidor



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Banana

Diseases and pests

Panama disease

Panama disease or Fusarium Wilt was first identified in 1874 in Australia. It is now observed in almost all tropical and subtropical banana production zones. It is caused by the soil fungus *Fusarium oxysporum* sp. *cubense* (FOC).

Different races have been identified. Under certain conditions (soil type, climate, crop intensification, drainage, etc.) each can cause serious vascular damage to the different banana varietal groups, making them practically non-productive.



Panama disease



Gros Michel

Race 1 originated in Asia and spread widely via movement of plant material in the form of suckers when the major export banana cultivation areas were established in the early Twentieth Century. It caused by the progressive disappearance of production of the Gros Michel variety in the Caribbean and Latin America in the 1940s and 1950s, when the variety formed the basis of international trade. Gros Michel was replaced in the industrial plantations by the resistant Cavendish varieties discovered in South-East Asia, which are now the fruits traded internationally. It should be noted that Gros Michel is still the reference for dessert banana consumption in most African and Latin American countries; production is still substantial at approximately 6 million tonnes per year. It appears that race 1 is not active in the areas in which it is cultivated extensively and combined with other varieties and other crops (hence at low density). Experiments conducted in Colombia have shown that Panama disease gains ground when the growing of Gros Michel is intensified (density greater than 1 000 plants per ha).

Race 2 affects the Bluggoe subgroup (ABB, cooking bananas).

Race 3 affects *Heliconia* spp. and sometimes Gros Michel.

Race 4, identified in the Canary Islands in 1931, affects the Cavendish group sporadically and under certain environmental conditions but only in subtropical zones (Canary Islands, South Africa, Taiwan, Australia) where it is relatively well controlled by the appropriate cultural techniques (buffer zones, fallow, etc.).

Race T4 has just appeared in Mozambique (though also in Jordan). It is a relatively recent form, described in 1990. It afflicts Cavendish group varieties, but hitherto had only been found in the wet tropical zones of Asia, especially Taiwan, Indonesia, Malaysia, South China, Australia and the Philippines. In 2011, **FruiTrop** published a full set of recommendations (see **FruiTrop** no.191, July-August 2011, pages 20 and 21), to be followed very closely in order to apply effective preventive measures. An ad-hoc committee of scientists specialising in this disease was formed in order to investigate the origin of its introduction and analyse the risks of extension. This alarming news has reactivated the world phytosanitary monitoring networks, particularly in Latin America.

All the specialists agree that the main cause of the spread of the disease is the movement of plant material (suckers and corms) from susceptible, infected plantations. Contamination via the soil from an infected area is very slow.

Prevention and control

CAs for numerous soil pathogens, control methods are limited and consist essentially of keeping areas containing the outbreaks in quarantine. Not much interna-



tional work is being performed on this disease, study of which is complicated. Control methods are not specific to bananas and are and will remain very limited. Conventional genetic improvement remains an important and as yet little-explored pathway.

International awareness of the importance of respecting rules for the movement of germplasm and the wide adoption of tissue culture plants by the banana industry should limit the present risks. The dispersion of race T4 is under surveillance. However, with strict control of germplasm movement and the surveillance and eradication of infected plants, the prospect of rapid spread of the disease is very improbable.

Sigatokas

Sigatokas are banana plant foliar diseases caused by pathogenic fungi of the genus *Mycosphaerella*. There are three distinct types of sigatoka: yellow sigatoka, caused by *M. musicola*, black sigatoka (or black leaf streak disease - BLSD) caused by *M. fijiensis*, and a third form still little known and restricted in scope (India, Nigeria) caused by *M. eumusae*.

Due to its geographic distribution and aggressiveness, BLSD is the most worrying form of sigatoka, and one of the main production constraints on the export banana worldwide. Unlike yellow sigatoka, it also affects plantain plants. First detected in the early 20th Century on



the Pacific islands of Fiji, BLSD is now present in all producer countries in Central and Latin America, Africa and Asia (except India), where it has gradually replaced yellow sigatoka. The Caribbean zone was long spared thanks to its insularity. Yet BLSD was detected in Saint Vincent and French Guiana in 2009, and then Saint Lucia in early 2010, in Martinique in September 2010 and finally in Dominica and Guadeloupe in early 2012. So the whole of the West Indies is now affected by the disease. Worldwide, only the Canaries are still free from BLSD, as well as Australia which has eradicated it several times.

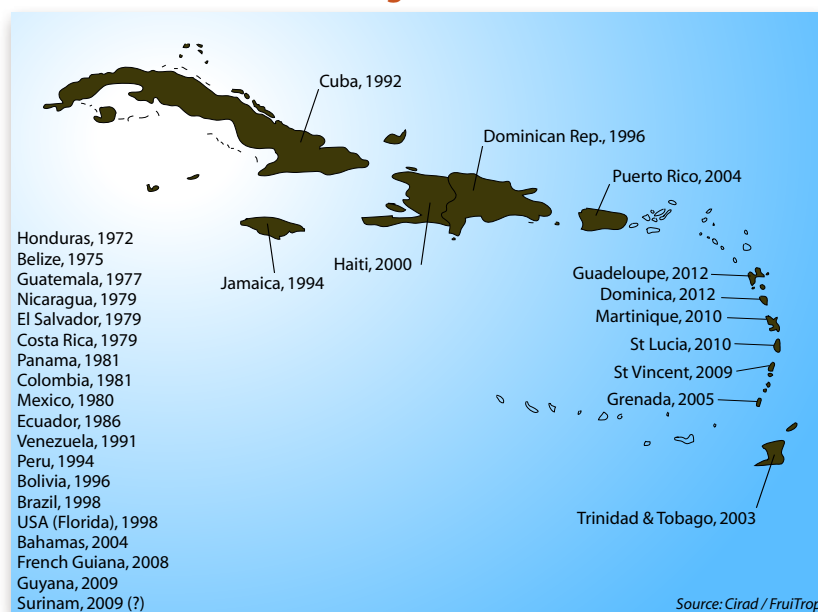
BLSD is manifested by lesions on the leaves, which can very rapidly develop into necrotic streaks. The reduction of the foliar surface area of the banana plant before harvesting the cluster can therefore significantly reduce yields. However, the major effect of BLSD in export cultivation is early maturation of the fruits, which become unexportable unless suitable control methods are applied. It is disseminated mainly by wind, over distances ranging up to tens of kilometres, making large-scale control a must in order to be effective.

A variety of management strategies

In most export dessert banana production zones, control of the disease is based on regular applications of chemical fungicides by aerial or ground-level application. However the management strategies vary greatly depending on the situations, and can lead to highly variable treatment levels.

In 1970s in the French West Indies, CIRAD alongside professionals from Guadeloupe and Martinique, developed a rational management strategy based on a biological forecasting method based on regular observation of the disease and on analysis of climate descriptors. This strategy makes it possible to moni-

Distribution of Black Sigatoka in the Caribbean arc



tor the dynamic of the disease and activate the treatments only when they are necessary. Its main benefit therefore is limiting the number of treatments, while ensuring optimum control of the disease. Thus yellow sigatoka has been controlled for more than 40 years, with a limited number of treatments (five to seven on average per year). The lasting success of this method was also based on organisational aspects, since management was centralised by a technical unit responsible both for decision making (application date, product selection), but also execution of aerial treatments over homogeneous treatment zones. This method was then applied to BLSD control in the FWI, but also in other parts of the world, where it ensures rational and effective control of the disease.

This strategy is based on using systemic fungicides with a powerful curative effect used in regular rotations between various active ingredient families, and mixed with paraffin oils whose fungistatic effect reinforces the curative effect of the treatments. Three main chemical families of systemic fungicides were employed due to their powerful curative effect: triazoles, strobilurins and benzimidazoles, as well as a new family (SDHIs) which has just come onto the market. Other fungicides with a lesser curative effect (morpholines and pyrimidines) have also been employed in these strategies. Unfortunately, due to their mode of action, these fungicides are particularly sensitive to development of pathogen resistance. Repeated use of these products can therefore promote the progressive emergence of pathogen strains less sensitive to their action, eventually threatening the effectiveness of these strat-



egies. This dynamic depends on whether these products are used rationally, but the very high adaptability of the pathogen means an inevitable eventual loss of effectiveness of these management strategies if they are based solely on fungicide use.

In Guadeloupe and Martinique, losses of sensitivity to benzimidazoles started to appear after ten years of rational use (though with no alternation) by means of a biological forecasting system. Triazoles had a longer useful life (twenty or so years for yellow sigatoka), since they were alternated with other fungicide families as they first came onto the market. However, sensitivity to these fungicides for control of yellow sigatoka rapidly deteriorated when only triazoles could be employed, with the other fungicides taken off the market. Fortunately, the strains of *M. fijiensis* that had invaded Guadeloupe and Martinique were sensitive to all groups of fungicides. Now only two triazoles and one strobilurin are approved in France. Since the risk of resistance is very high for strobilurins (1 treatment per year, 2 at most), triazoles remain the most frequently employed. Four to five years after the arrival of BLSD to the FWI, the sensitivity levels of the fungus to these various fungicide families remain good, although a slight decline in sensitivity to triazoles has been observed in Martinique. In Cameroon and Côte d'Ivoire, the forecasting methods for BLSD were able to limit the number of applications between 12 and 14 per year for a decade, until the progressive emergence of resistant strains in certain zones. Conversely, in Latin and Central America, these declines were much faster. Resistance to benzimidazoles, used on a massive scale when they came onto the market, was observed just two years after they were first used. The same phenomenon was then observed in these production zones when triazoles appeared, and then strobilurins;



hence nowadays they are used very sparingly due to their low effectiveness.

In these situations, the implementation of rational strategies is no longer possible, and a strategy of systematic management has been progressively applied, based on use of contact products with a preventive effect. The main ones include chlorothalonil or mancozeb. They must be applied very regularly to ensure their effectiveness, often in mixture with systemic fungicides, with sometimes more than 50 applications per year. The doses of active substance used have also increased massively, from 2 to 4 kg of active substance per year with forecasting methods, to 30 or even 70 kg in systematic strategies. So use of these strategies represents an economic, logistical and above all environmental cost incompatible with many production zones, especially in the FWI.

The FWI also has to cope with a particularly limiting context in terms of implementing chemical management, even if rational. Current European legislation strictly limits the range of products usable, with only three fungicides used today: two triazoles and one strobilurin. While two new products are set to be approved, the implementation of optimum rational management remains highly constrained. On the other hand, the prohibition of any aerial treatment in Guadeloupe and then Martinique in 2013 has also transformed the organisation of disease management in the FWI, previously centralised around an independent technical unit responsible for generalised treatment. Individualisation of disease management and the lack of ground-based treatment equipment are currently threatening the effectiveness of disease control in these areas: the risk of development of resistant strains is becoming higher, with disease management no longer a collective strategy.



Essential new means of disease management

The sustainability of chemical disease management, whether rational or systematic, is therefore compromised in the long term. We need to be able to develop new management tools and methods to offer viable alternatives for BLSD control in the various production contexts worldwide. These alternatives will be based on the development of integrated approaches, relying on a combination of various tools enabling the disease and/or its damage to be controlled (losses in terms of fruit yield and quality).

The creation of new hybrid banana varieties with long-lasting resistance to the disease is an avenue long contemplated as an alternative to the Cavendish variety, widely used but particularly sensitive to the disease. However the processes of creating and selecting new varieties take a long time, and the list of agronomic and organoleptic criteria that these varieties have to meet makes the task particularly difficult. The variety CIRAD 925 recently developed in the FWI shows promising potential, currently under study and assessment by the researchers and the French export industry.



Moko disease

Whether or not they are BLSD-tolerant, the varieties cultivated must be incorporated in innovative and sustainable cultivation systems, employing optimised cropping management methods (plant management, inoculum management and control of fruit conservation by defoliation, etc.), potentially making use of biocontrol products, or introducing spatial and temporal modifications to the cropping system, thereby enabling a gradual reduction in use of chemical management.

Bacterial diseases

Bacterial diseases are an increasing concern for growers because of the way in which they spread and the lack of resistant varieties.

Moko disease

caused by *Ralstonia solanacearum*
(biovar 1 race 2)
formerly *Pseudomonas solanacearum*

Two types of symptoms are observed depending on whether the bacterium is spread via the soil or by the planting tools used (machetes, etc.) or by insects that visit male flowers or their scars after abscission. Upward bacterial colonisation results first in chlorosis and the wilting of the three youngest leaves and then the death of the plant. A cross-section of the pseudostem (or corm) reveals reddish-brown colouring of the vascular vessels. The presence of abundant bacterial exudate is a further sign of bacterial infection. If the contaminated plant bears a fruit bunch, the bacterium colonises all the vascular bundles of the fruits via the rachis. Accumulation of ethylene may cause the premature yellowing of the fruits and cross sections display serious browning. When the bacterium is spread by a machete for example after the cutting of the pseudostem, the contaminated suckers blacken and become stunted in 2 to 4 weeks. The disease was described for the first time in Trinidad in 1910 and is still absent from the Lesser Antilles, except in Trinidad and Grenada. In contrast, it spread rapidly in the Amazon basin in Brazil and in eastern Peru, going as far as northern Guatemala and southern Mexico. It covers a large geographic area. Moko disease spread to the Philippines in 1968 via plant material. There are no resistant varieties or chemical control methods. Only eradication and quarantine give results.

Bacterial wilt

Banana *Xanthomonas* Wilt (BXW),
Banana Bacterial Wilt Disease (BBW),
caused by *Xanthomonas campestris* pv. *musacearum*

The symptoms are observed above all on the emergence of spear leaves, especially at flowering. Flower bracts become discoloured and the male bud blackens and shrivels. The leaves yellow, wilt, blacken, dry and crumble (including the pseudostem). Yellow or brown vascular streaks are observed throughout the plant together with pale bacterial secretion on a section at the base of the pseudostem or at the corm. This causes bunches to wilt, with premature maturation and a reddish brown colour inside the fruit. The plant dies within a month of the appearance of any of these symptoms (one month after infection). The disease is spread by foraging insects, infected plant material (suckers, bunches and leaves), tools and man, and also by animals, run-off, rainwater splashes and wind. There are no resistant varieties. It is controlled by a quarantine period lasting for several months and the destruction of infected plants and those nearby. Free movement of animals is forbidden. This wilt was observed and described in Enset in Ethiopia in about 1968 (this affected the staple foodstuff of 12 million people), and then in Uganda where it has spread since 2001 (75 km per



year). Uganda was the second largest banana producer with 10.5 million tonnes (250 to 450 kg per person) and this had decreased by nearly 40% in 2006. The spread has been rapid, with the disease reaching the Democratic Republic of Congo in 2004, Rwanda in 2005 and Burundi, Tanzania and Kenya in 2006.

Viral diseases

Viral diseases of the banana (dessert and cooking fruits) have spread increasingly in recent years as a result mainly of the ease of plant movement and demand for diversification. They consist of banana bunchy top disease and mosaic diseases including banana mosaic, banana streak disease and bract mosaic. The economic damage varies, affecting all cultivated bananas and both large estates and village plantations. Banana bunchy top disease (caused by the banana bunchy top babuvirus, BBTV) can cause losses of 90 or even 100 percent of production. Banana streak disease (caused by the banana streak badnavirus, BSV) causes losses of 40 to 60 percent, and banana bract mosaic (caused by the banana bract mosaic potyvirus, BBrMV) results in losses of more than 40%. It spreads either by vector from outbreaks or by the use of infected germplasm—suckers or tissue culture plants—or, in the special case of BSV, from so-called 'silent' bananas with a virus sequence incorporated in the genome of the species *Musa balbisiana* and capable of producing viral particles in particular as a result of stress (abiotic phenomena, weather conditions, intensive in vitro or in vivo propagation of plant material, etc.).



Banana bunchy top disease (BBTV)

The plants are markedly stunted and rosetted at the top. The narrow, erect, brittle leaves display strongly chlorotic borders. The characteristic symptom is the appearance of discontinuous dark green streaks along the pseudostem, the main leaf vein and the secondary veins. When the mother plant is infected, so are all the suckers. The most effective vector is the banana aphid *Pentalonia nigronervosa*.



Mosaic diseases

Banana mosaic caused by the Cucumber mosaic cucumovirus (CMV)

Infected plants display leaf chlorosis and mottling of the main vein and the pseudostem. Secondary infections may appear in the form of bacterial rots in the sheaths forming the pseudostem. The virus can be spread by a broad range of aphids. The disease can also be spread by pruning tools.

Banana streak disease (BSV)

The leaf lamina displays discontinuous yellow streaks that rapidly become necrotic. The main vein is unaffected. In severe forms of the disease, the cigar tip becomes necrotic and the plant dies. If the mother-plant is infected so are all the suckers.

The disease is transmitted by various mealybug species—*Planococcus citri*, *Saccharicoccus sacchari* and *Dysmicoccus brevipes*. In recent years, BSV in-

fections unrelated to external contamination have been described in various parts of the world. There are two different causes: 1) tissue culture plants derived from micropropagated healthy interspecific hybrid varieties of banana and 2) the hybrid progeny of crosses between healthy *Musa acuminata* (genome A) and *Musa balbisiana* (genome B) parents. Various abiotic stresses cause the appearance of the disease in these hybrids, correlated with the presence in the genome of the *M. balbisiana* parent of endogenous viral sequences of BSV (e-BSV) containing all the information required to synthesise the infectious virus.

Banana bract mosaic (BBrMV)

The first stages of infection consist of greenish yellow streaks turning into brownish red necrosis on the leaf lamina and veins. Yellow mottling or whitish streaks are seen on the pseudostem according to the variety infected. Bract mosaic is the final symptom. The disease is transmitted to all the suckers by aphids (*Ropalosiphum madiis*, *Myzus persicae*).

The only control method available today to fight these banana virus diseases is control of the vector and the use of healthy plant stock. Indeed, there are no bananas with natural resistance to these diseases and no cure other than eradication after a virus attack.

The procedure to be followed is based mainly on the use of disease-free germplasm—suckers or tissue culture material screened for viruses—and the cutting back of weed growth where aphids multiply.



Banana borers

Originating in South-East Asia, the banana borer has spread to all subtropical and tropical banana and plantain production regions. The insect (*Cosmopolites sordidus*) is 9 to 16 mm long and 4 mm wide. It moves freely in the soil at the feet of banana plants or in plant debris. It is nocturnal and very sensitive to drying. The pest is spread mainly via infested plant stock. The adults do no damage. The females lay eggs in the banana rhizome and the larvae feed on this, digging tunnels. These tunnels disturb water and mineral supply of plants, lengthen the production cycle, cause serious decreases in yield and weaken the anchorage of the plants, making them more sensitive to wind. Strong attacks can lead to the death of the plant. In addition to classic chemical treatment, the use of healthy planting stock (tissue culture plants) used in clean soil (after fallowing) is a method of borer control. New borer trapping methods using pheromones (sordidin) are available. A control system combining entomophagous nematodes and sordidin traps is being developed.

However, the banana borer remains a major pest constraint for banana crops—whether on industrial plantations or smallholdings (plantains are very susceptible to the banana borer). It seems fairly unlikely that improved varieties can be bred rapidly. Control on plantation scale based on the use of traps and maintaining low levels of infestation are being studied, and may in time form an alternative to chemical control.

Nematodes

Numerous nematode species parasitise banana roots and corms. Root knot nematodes (*Meloidogyne* spp.) and spiral nematodes (*Helicotylenchus* spp.) are found



Nematode



Banana borer on a corm

all over the world in all kinds of crop. However, the most damage is caused by the migrating nematodes *Pratylenchus* spp. and *Radopholus similis*. The latter species is found everywhere in the hottest banana growing zones and especially in intensive plantations where it arrived via germplasm movements during the spread of the crop during the past two centuries. *Pratylenchus coffeae* is also present in the hottest zones but is generally indigenous and found mainly on plantain crops. *Pratylenchus goodeyi* prefers cooler areas and originated on the Africa plateaux. It is observed in certain subtropical zones such as the Canary Islands, for example.

Underground enemies

Pratylenchus spp and *Radopholus similis* are migratory endoparasites whose full biological cycle lasts for 20-25 days in root and corm tissues. Juvenile forms and females are always mobile and can leave the roots when conditions are no longer favourable. These migratory forms can then colonise other roots. As they move within and between cells, these nematodes feed on parenchyma cell cortical cytoplasm, destroying cell walls and creating tunnels that become necrotic and can extend to the whole of the cortex. Root and corm necrosis may be aggravated by other pathogens (fungi and bacteria). In particular, fungi of the genus *Cylindrocladium* are pathogenic and can cause lesions similar to those made by nematodes. The combination of the two pests may cause very serious damage under certain conditions. The destruction of underground tissue leads to a decrease in water and mineral nutrition resulting in slowed plant growth and development. This can lead to severe decrease in bunch weight and lengthen the period between harvests. Furthermore, destruction of the roots weakens the anchorage of the plants in the ground and increases the risk of toppling, especially during hurricane periods, with a strong economic impact.

Prevention and control

Control methods involving the application of chemicals (mainly organophosphorus compounds and carbamates) that carry substantial sanitary and environmental risks are still used in intensive plantations. For this reason, in spite of their efficacy and very easy application, their use will be increasingly limited in favour of alternative control measures. These include cultural practices improving soil fertility (tillage, irrigation, organic ameliorators, etc.) that indirectly improve plant tolerance to pest pressure. More direct methods such as the use of fallow and the planting of micropropagated bananas are now in common use and lead to a strong decrease in nematode populations (cf. Phytoma No. 584, July-August 2005). These methods are widely used by producers in Martinique and Guadeloupe, where they have contributed to a reduction in pesticide use of more than 50 % over the past decade.

In the more or less near future, biological antagonists, root symbionts (mycorrhiza) and above all genetic resistance (by hybridisation or clonal selection) will be employed in setting up increasingly effective integrated protection strategies. However, the great complexity of nematode populations makes it tricky to develop these more targeted techniques. To be effective, they will need to be able to take into account the diversity of the cultivation and ecological situations.

Post-harvest diseases

Storage diseases (wound anthracnose, ripe-fruit (quiescent) anthracnose and crown rots) strongly limit the sale of exported bananas. *Colletotrichum musae* causes both forms of anthracnose, while crown rots result from a larger parasite complex consisting of *C. musae* but also other organisms: *Fusarium*, *Verticillium*, *Botryodiplodia*, etc.

Distinction is made between two forms of anthracnose:

Ripe-fruit (quiescent) anthracnose: brown lesions develop on fruits after ripening and subsequently in the sales channel. This disease rarely has serious commercial consequences.

Wound (non-quiescent) anthracnose: broad brown lesions occur on fingers wounded during harvesting



or packing. The symptoms are observed when fruits are unpacked after sea transport and have serious commercial consequences.

Crown rots are fungi that spread from cut surfaces when fruits are prepared at the packing stage. This damage is also visible after sea transport and has serious commercial consequences.

The fungi that cause post-harvest diseases are widespread in banana plantations and hence on bunches if these are not protected. In other words, control of infection begins when the inflorescence shoots at the top of the leaf cluster. Anthracnose results mainly from contamination by *Colletotrichum musae* in the field. It is not possible to detect infected fruit with the naked eye at harvesting but a test can be performed more than three weeks before cutting. Fruits are infected mainly during the first month of flowering. Spores are spread by water and develop on the organs when they start to decompose (old leaves, bracts and above all flowers). Control of the disease must begin in the field and then continue in the packing shed.

Hands can be contaminated by crown rot at various stages in the chain. This greatly complicates the implementation of control measures, but hand contamination by washing water is probably the main cause.

Chemical control of these diseases does not always yield satisfactory results. Indeed, it is sometimes ineffective according to the production zone, and the time of the year and resistance to fungicide has developed in the various fungal species involved. Finally, interest in developing methods other than chemical control is increasing. Indeed, these post-harvest treatments raise two crucial problems—the risks of residues in fruits and the processing of fungicide discharges near packing stations ■

Banana

Genetic diversity

Over a period of thousands of years, population migrations and movement of plant material have placed the banana in very different ecological contexts on the various continents. Farmers have succeeded in harnessing the natural mutations resulting from vegetative multiplication. This combination of natural reproduction and selection by man since ancient times has resulted in the present genetic diversity.

Bananas originated in South-East Asia as wild seminiferous plants. Natural crosses built up a large base of genetic diversity that still exists today. These crosses were the origin of the seedless varieties. These bananas have food qualities that soon interested man, who incorporated them in agriculture using their vegetative multiplication potential.

From the botanical point of view, the genus *Musa* is divided into seminiferous species with inedible fruits and parthenocarpic varieties with fleshy seedless fruits. The *Eumusa* section includes *Musa acuminata* (genome symbol: A) and *Musa balbisiana* (genome symbol: B). These are wild species at the origin of the cultivated varieties.

The latter are classified according to their ploidy level and their genetic make-up. Some 1 200 varieties have been counted and classified around the world.

The inedible wild species with seed-containing fruits can be used for purposes other than human food-stuffs (fibre, livestock feed, etc.). They are all diploid (AA and BB). About 180 have been counted to date, all from South-East Asia, but the census is not definitive (especially for the BBs). These fertile varieties are nonetheless important since they possess different levels of resistance to pests and diseases. They therefore form base material for the various present and future conventional genetic improvement and varietal creation programmes. Numerous cultivars have been bred by man. They are classified in groups according to their genetic make-up and then in subgroups assembling the various cultivars derived from each other by natural mutation starting from a common genetic ancestor. Distinction is made between the following groups:

- diploid groups: AA (such as Figue sucrée or Frayssinette) and AB. These total about 290 cultivars grown mainly in South-East Asia where they originated;

- three triploid groups (at least 650 cultivars): AAA, AAB and ABB. The subgroups of each of these distinguish between the dessert varieties richer in sugar at maturity, cooking varieties with fruits that are firm and not sweet even when ripe, and sometimes bananas for beer-making by fermentation of the pulp (East Africa).

Even if the plants within the same subgroup display only weak genetic diversity, they do have a great range of phenotypes, resulting essentially from mutations and many centuries of selection by man. This is the case of the Cavendish (more than 20 cultivars), East African highland cooking and beer bananas (more than 150) and Central and West African plantain (more than 120) subgroups.

Although the intensive cultivation system used for approximately 25 percent of world production favours monovarietal production, it is important to remember that most production is based on less intensive family farming with the emphasis on varietal mixing. This contributes to continuing selection and hence ensures banana diversity ■

Thierry Lescot, CIRAD
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Banana — Estimated world production in 2014

Tonnes	Cooking bananas		Dessert bananas		Total
	Plantain AAB group	Highland bananas + ABB group + others	Cavendish	Gros Michel + others	
North America	0	1 000	6 525	100	7 625
South America	5 607 796	388 856	13 049 085	3 410 650	22 456 387
Central America	808 338	62 455	7 390 999	71 500	8 333 292
Caribbean	767 852	665 957	1 096 248	168 887	2 698 944
West and Central Africa	9 468 569	1 247 796	2 401 702	498 442	13 616 509
East Africa	966 418	15 785 050	3 519 093	893 683	21 164 244
North Africa and Middle East	33	9 067	2 226 494	71 882	2 307 476
Asia	2 113 680	16 406 438	31 098 370	11 460 263	61 078 751
Oceania	1 162	530 706	796 437	276 486	1 604 791
Europe	2	17	423 900	27	423 946
World total	19 733 850	35 097 342	62 008 853	16 851 920	133 691 965

Source: Thierry Lescot - CIRAD according to references, surveys, professional sources, FAO, etc.

Wholesale market prices in Europe

March 2017

					EUROPEAN UNION - EURO		
					France	Holland	UK
AVOCADO	Air	TROPICAL	BRAZIL	Box	15.60	17.50	
			PERU	Box		12.00	
			COLOMBIA	Box	13.50		
			ISRAEL	Box	13.58		13.82
			MEXICO	Box	13.58		
			PERU	Box			18.43
	Sea	NOT DETERMINED	CHILE	Box	13.58		
			KENYA	Box			9.79
			SOUTH AFRICA	Box			12.55
	Truck	PINKERTON	ISRAEL	Box	10.50		
			SPAIN	Box			10.02
			SPAIN	Box	14.25		
			MOROCCO	Box	14.50		
BANANA	Air	RED	ECUADOR	kg		5.25	
			COLOMBIA	kg	6.90		
	Sea	SMALL	ECUADOR	kg		5.83	
			ECUADOR	kg	1.95		
CARAMBOLA	Air		MALAYSIA	kg		4.71	
CHAYOTE	Sea		COSTA RICA	kg	1.70	1.69	
COCONUT	Sea	NOT DETERMINED	COTE D'IVOIRE	Bag	10.50	12.42	12.04
			SRI LANKA	Bag			8.64
		YOUNG	THAILAND	Bag		18.50	
			COSTA RICA	Bag		16.75	
DATE	Sea	DEGLET	ALGERIA	kg	4.80	2.19	
			ISRAEL	kg	9.00	7.31	7.37
			ALGERIA	kg		2.80	
			ISRAEL	kg			3.46
EDDOE	Sea		COSTA RICA	kg		1.97	
GINGER	Sea		CHINA	kg	1.80	1.47	1.31
			THAILAND	kg	2.10		
GUAVA	Sea		BRAZIL	kg			2.53
KUMQUAT	Air		ISRAEL	kg		4.75	
LIME	Air		MEXICO	kg	5.50		
	Sea		BRAZIL	kg	1.50	1.98	1.86
			MEXICO	kg		2.44	
LITCHI	Sea		THAILAND	kg			2.30
MANGO	Air	KENT	PERU	kg	7.50	5.33	
			THAILAND	kg		9.00	
	Sea	NAM DOK MAI	BRAZIL	kg		1.88	1.82
			PERU	kg	2.75	2.13	
MANGOSTEEN	Air		THAILAND	kg		9.00	
			INDONESIA	kg		9.00	
MANIOC	Sea		COSTA RICA	kg	1.50	1.47	
MELON	Air	CHARENTAIS YELLOW	DOMINICAN REP.	kg	5.00		
			SENEGAL	kg	3.10		
	Sea	CHARENTAIS	BRAZIL	kg			2.12
			HONDURAS	kg			1.84
			BRAZIL	kg		1.65	2.05
			COSTA RICA	kg		1.80	
		CANTALOUPE	HONDURAS	kg		1.65	1.73
			BRAZIL	kg		1.45	1.84
			COSTA RICA	kg		1.60	
			HONDURAS	kg		1.45	1.64

					EUROPEAN UNION - EUROS		
					France	Holland	UK
MELON	HONEY DEW	BRAZIL	kg		1.20		1.44
		COSTA RICA	kg			1.10	
		PANAMA	kg				1.09
	WATERMELON	GHANA	kg				1.11
		BRAZIL	kg				1.01
		COSTA RICA	kg		1.50		
	PIEL DE SAPO CHARENTAIS GREEN	PANAMA	kg				1.34
		BRAZIL	kg				1.02
		MOROCCO	kg		2.13		
PAPAYA	Air	FORMOSA	BRAZIL	kg		2.83	
		NOT DETERMINED	BRAZIL	kg	3.50	3.36	2.72
			ECUADOR	kg		2.50	
			JAMAICA	kg		3.71	
PASSION FRUIT	Air	NOT DETERMINED PURPLE	COLOMBIA	kg	5.50	6.00	4.61
			BRAZIL	kg			4.76
			ISRAEL	kg		6.25	
			SOUTH AFRICA	kg		6.00	
		YELLOW	VIETNAM	kg	8.50		
			ZIMBABWE	kg		6.00	
			COLOMBIA	kg		10.00	
			ECUADOR	kg		8.80	
PHYSALIS	Air	PREPACKED	COLOMBIA	kg	10.00	8.00	7.20
			ECUADOR	kg		8.00	
	Sea		COLOMBIA	kg		6.80	
PINEAPPLE	Air	MD-2 VICTORIA	BENIN	kg	2.30		
			MAURITIUS	Box		13.50	
			MAURITIUS	kg	3.90		
	Sea	MD-2	REUNION	kg	4.10		
			BRAZIL	Piece			2.30
			COSTA RICA	Box		17.00	
			COSTA RICA	kg	1.70		
			COSTA RICA	Piece			1.67
			COTE D'IVOIRE	kg	1.70		
PITAHAYA	Air	RED	THAILAND	kg		7.17	
			VIETNAM	kg		7.50	
			INDONESIA	kg		8.67	
		YELLOW	ECUADOR	kg		10.00	
PLANTAIN	Sea		COLOMBIA	kg	1.10		
			COSTA RICA	kg			1.28
			ECUADOR	kg	1.05	1.03	
POMEGRANATE	Air	NOT DETERMINED	TURKEY	kg		3.64	
			INDIA	kg		3.93	4.77
		WONDERFUL SMITH	SOUTH AFRICA	kg		3.95	
			PERU	kg		4.08	
			SOUTH AFRICA	kg		3.95	
		ACCO	SOUTH AFRICA	kg		3.68	
	Sea	HERSKOWITZ	EGYPT	kg			1.50
		NOT DETERMINED	TURKEY	kg			1.73
RAMBUTAN	Air		VIETNAM	kg		9.75	
SAPODILLA	Air		THAILAND	kg		8.00	
SWEET POTATO	Sea	NOT DETERMINED	BRAZIL	kg		1.55	
			CHINA	kg			1.15
			EGYPT	kg	0.90		
			HONDURAS	kg		1.17	1.39
			SOUTH AFRICA	kg	1.60		
		WHITE	HONDURAS	kg	1.60		
TAMARILLO	Air		COLOMBIA	kg		7.40	
TARO	Sea		COSTA RICA	kg	2.60		
YAM	Sea		BRAZIL	kg			1.10
			GHANA	kg	1.30	1.43	

Note: according to grade

These prices are based on monthly information from the Market News Service, International Trade Centre UNCTAD/WTO (ITC), Geneva.
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