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FRuiTROP

English edition

Counter-season avocado

Relative calm

Close-up

Banana

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cirad

Close-up by
Denis Loeillet

Banana

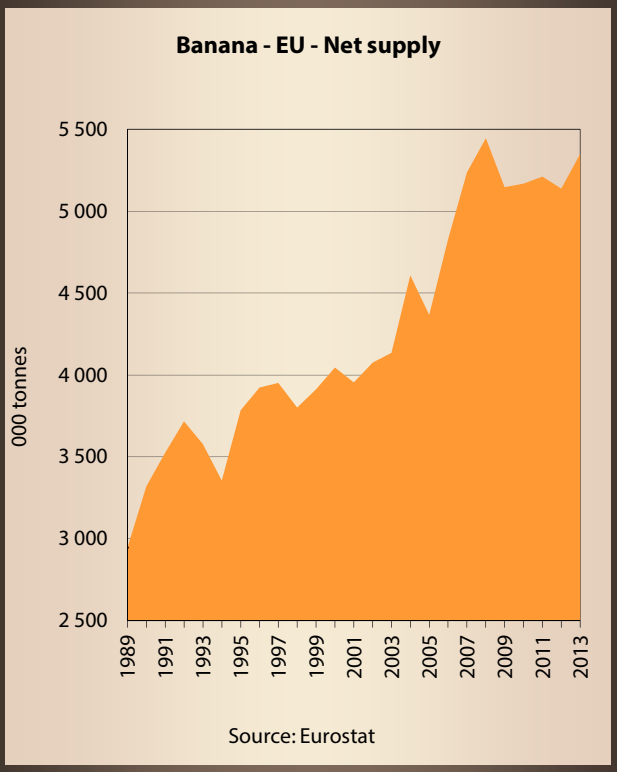
Contents

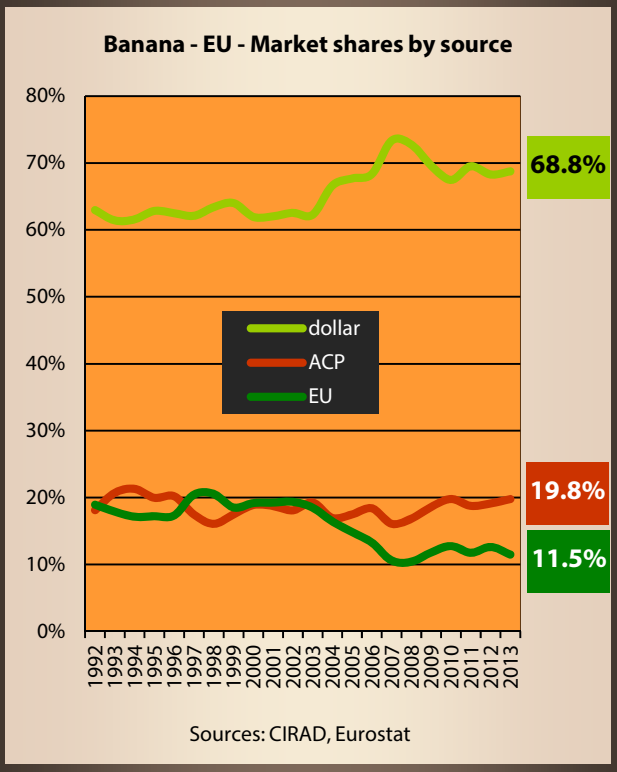
Following on from the price review which appeared in edition 218 of January 2014, **FruiTrop** now offers its traditional volumes review. Besides the issue of the supply to the European market, covered in detail, we also provide focuses on the United States, Russia, Japan, and also China. And because the big Chiquita-Fyffes merger is making the news, **FruiTrop** has called in some heavyweight experts to share their analysis of the repercussions of this alliance between two giants of the sector.

World banana market

Happy!

The banana market saw no fundamental changes in 2013, but benefitted from the shortfall in the other fruit sectors, a relatively kind year in terms of climate vagaries at the production stage, and weather in Europe favourable for banana consumption. True, the basics are still in place, without anything spectacular, but we can be pleased about the very steep rise in consumption in Europe, the United States and also Russia.



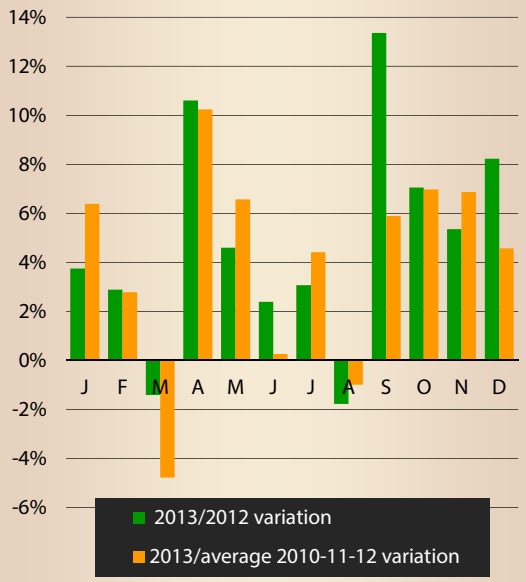


There can now no longer be any doubt, Pharrell Williams' worldwide hit "Happy" must have been inspired by the highly favourable development of the international banana market. In our January edition, we dedicated a dossier to a 2013 price review (FruiTrop no. 218, January 2014, page 35 et seq.), and observed that, despite the slight fall in the import price in Europe, rates had remained highly satisfactory. Less optimistically, we also emphasised the fact that we were in a banana bubble, and that there was nothing new under the sun. The banana is the absolute mainstay fruit of the fruits and vegetables section, taken hostage by the big supermarkets, which in their eagerness to attract consumers to their shelves are prepared to offer this anti-crisis product cheaper than their competitors, to improve their sales of yogurts, tubes of toothpaste or electronic apparatus. In the actual words of the spokesman for Tesco, the leading British supermarket and the world number three, the in-store price of a banana has nothing to do with the fundamental market economics, or in particular with the price paid to the producer (fortunately for the producer!). It's a loss leader, full stop.

Practically flawless

In short, the banana market in 2013 was the fortunate beneficiary of a combination of exceptional circumstances, which often occurred outside the sector. We have mentioned the calamitous 2012-13 European apple production season, the weather favourable for banana consumption (cold, humidity, etc.), the foul spring

Banana - EU
Supply variation



Sources: CIRAD, Eurostat

which restricted the supply of competing fruits (spring and summer fruits), etc. The stars were perfectly aligned in 2013. We can now show that the results were also there in terms of volume. The rise in the supply to the European market set a new record. The growth rate between 2012 and 2013, on a like-for-like basis (EU -27) amounted to 4.1 %! This level was exceeded only in 2007, thanks to the expansion of the EU with two new Member States (Bulgaria and Romania). According to CIRAD's estimates, the EU-27 consumed 5 348 934 tonnes; or slightly more (+ 40 000 tonnes) if we take the Eurostat data for Peru, which incorporated a declaration error by an operator, and the final figures for which should be rectified within a few months.

While we can be very content, the level reached in 2013 does not represent an absolute record. In 2008, Europeans scoffed 5.444 million tonnes, driven by a colossal dollar supply of nearly 4 million tonnes. Nevertheless, 2013 saw an admirable performance… though not universally. In fact of the three groups of sources supplying the EU, only European production is out of step. Its supply fell by 5 %, while the dollar banana (+ 5 %) and above all the ACP banana (+ 8 %) achieved a dream year. We will come back later in this dossier to the losers and winners of 2013. Ultimately, the market share of the European banana fell to 11.5 %, while the imported banana share rose to 88.5 %; a very sad record in itself for the Community's production sector. The previous one goes back to 2008 (89.6 %), but this was in large part due to Cyclone Dean hitting the FWI banana plantations, thus leaving the field open to the imported banana.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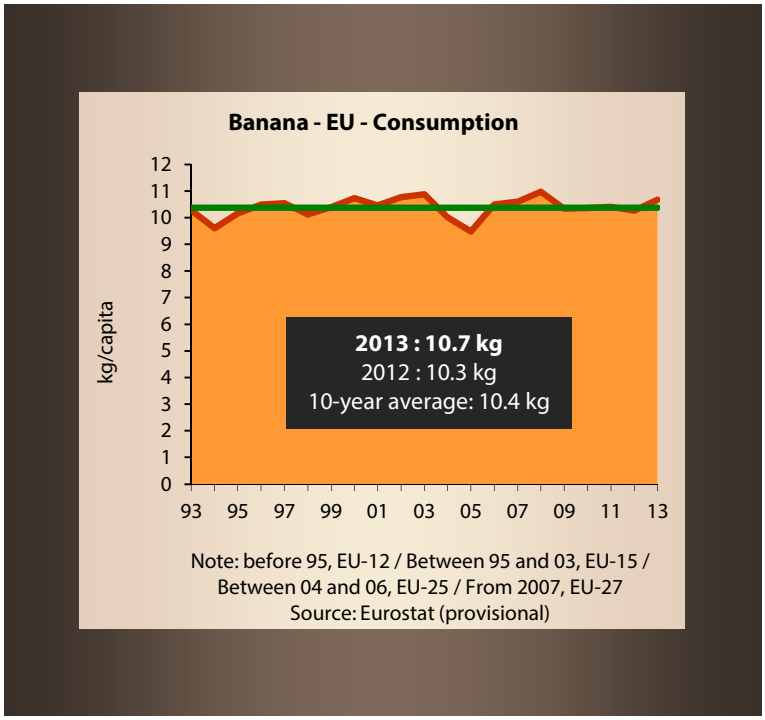
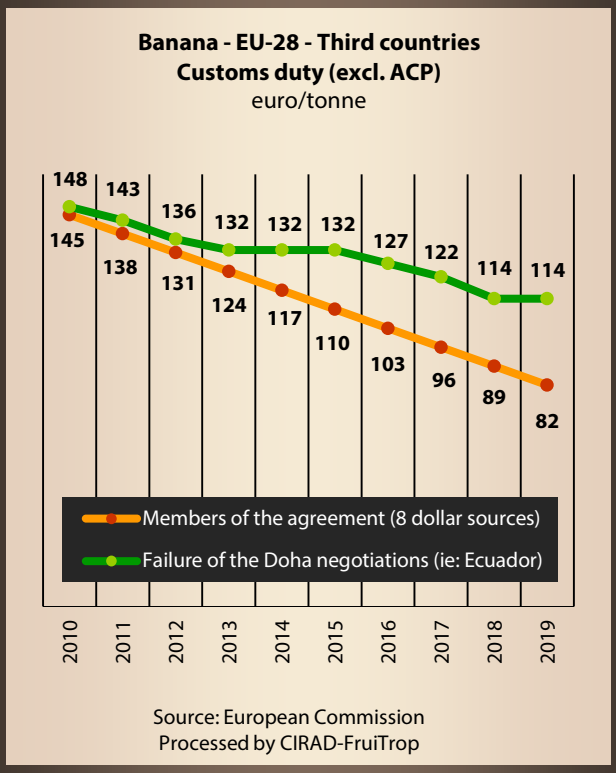


EU consumption: + 400 grams!

The banana entry points into the European Union are still the same. Belgium, the United Kingdom, Germany, Italy and France accounted for 80 % of imports. If we count European produce, Spain came in just behind France.

The upward trend in 2013 was not packed into just a few months. There was growth from 2012 month after month, 11 times out of 12. It was just March 2013 that saw a slight fall in imports. If we take European produce into account, the result are not much different. True, August also fell into the red (- 2 % from 2012), but without compromising the positive supply trend observed over the year as a whole.

Driven by this supply surge, in excess of EU population growth, consumption was up 400 g, rising to 10.7 kg/capita/year, i.e. 300 g less than in 2008. This too is excellent news for the sec-



Source: European Commission
Processed by CIRAD-FruiTrop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tor; and there have been no cultural exceptions, with all the Member States joining in with the party. Consumption has leapt forward practically everywhere in Europe.

The European Union is not an isolated case. The US market has also leapt forward, although there is less joy at this good market dynamic, since it is a very common phenomenon, and exclusive for the past three years. The symbolic 4-million tonne mark was beaten in 2013, and consumption per capita, as in the EU, has gained some 400 g to rise to 12.5 kg/capita/year: a figure approaching the absolute record of 12.8 kg/capita reached in 2000 (after rectification of the statistical error in 1999).

So in view of the rather favourable situation in terms of volume, can we contemplate even better days? The initial data for 2014 have confirmed the positive trend, especially in Europe. Over the first two months, imports were up 7 % from 2013, i.e. 58 000 tonnes more! We should beware extrapolating the trends, since as Alphonse Allais reminds us, the dustbins of history are full of them ■

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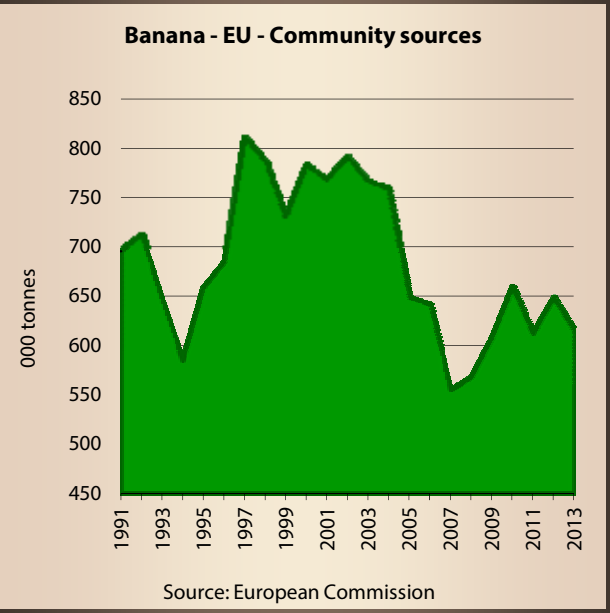
European banana market

Overall supply: dynamic year round

In 2013, the EU banana market amounted to nearly 5 349 000 tonnes, just below the absolute record from 2008, when it consumed 5 445 000 tonnes. This is excellent news for the European market, which against all expectation is exhibiting some degree of vitality. Those of a less optimistic disposition, such as yours truly, will point out that the good market performance can be explained by factors completely foreign to the sector. In our January 2014 edition, we highlighted the positive context for the fruit, which can be summarised, perhaps unfairly, as: fall in competition from other fruits (throughout the year) and weather favourable for banana consumption (cold and wet conditions). But let's not get ourselves down. The market grew, and in significant proportions: + 210 000 tonnes, i.e. by the equivalent of the Polish market (2009-2013 average). Now let's take a detailed look at the situation in 2013 for each of the big sources.



Source: European Commission

Banana — Europe — Import and retail prices				
euro/box	**2012**	**2013**	**Diff.**	**Diff. %**
United Kingdom (£/box)				
Retail price Loose bananas	13.1	13.2	0.18	1%
Retail price Prepacked bananas	21.8	21.8	0.00	0%
Import price				
Spain				
Retail price Canaries bananas	32.5	36.8	4.35	12%
Retail price Other sources	24.3	24.7	0.36	1%
Import price Canaries bananas - Super Extra	15.6	17.7	2.10	12%
Germany				
Retail price Traditional retail distribution	23.0	23.8	0.73	3%
Retail price Discount stores	20.3	21.8	1.45	7%
Import price	14.1	13.7	-0.40	-3%
France				
Retail price	28.1	28.7	0.54	2%
Retail price Special offer	23.9	25.2	1.27	5%
Import price	12.9	12.6	-0.31	-2%
Italy				
Retail price	33.6	31.9	-1.63	-5%
Import price	13.5	12.9	-0.60	-5%
Czech Republic (CZK/box)				
Retail price	562.3	576.7	14.33	2%
Reference EU barometer (CIRAD)				
Import price	13.7	13.2	-0.56	-4%

Sources: TWMC, RNM, CIRAD

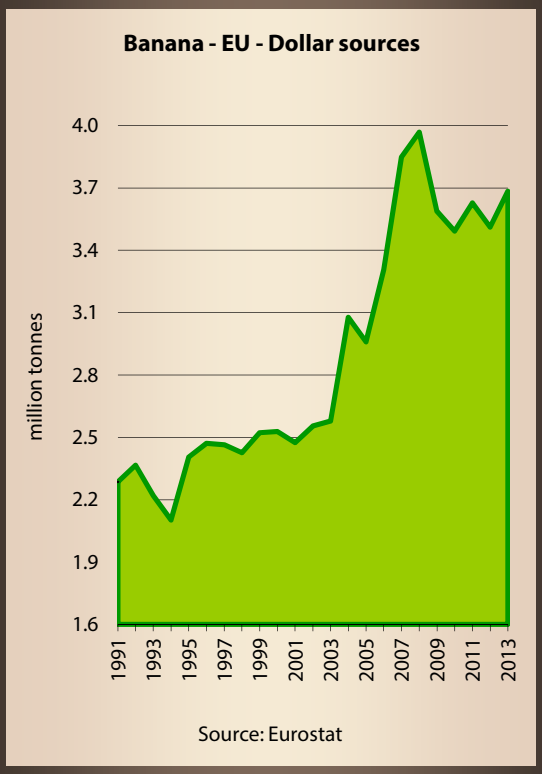
European production: can do better!

This source was the big, and the only, loser in 2013. European production went against the market trend. Cyclone Chantal, which hit Martinique and slashed its export potential (159 015 t, i.e. - 14 %), cannot explain the fall in the "European" source. The Canaries also missed out, with a 3 % fall to 360 981 t, though for the right reasons. Indeed, this measured fall should be compared against 2012, excellent in terms of volume (371 000 t) but awful in terms of value. In 2013, Spanish producers decided to recover their margins through tighter volume management. And they were quite right, since the reference price per box of bananas (Super Extra) went up by more than 12 % between 2012 and 2013, i.e. more than 2 euros. The profitability calculation did not take long to make.

The more modest sources also slipped into the red: Madeira for Portugal with - 11 %, Crete (Greece) with - 12 % and Cyprus with - 5 %. Finally, a special mention goes to Guadeloupe, which was the only European region in the black, with significant growth of 7 %, in excess of 70 000 t (71 511 t), thus marking its best performance for a decade!

Ultimately, European production is losing momentum on an expanding European market. Quite naturally, this is manifested by the fall in its market share from 12.6 % to 11.5 % between 2012 and 2013. We have to go back to 2008 to find as poor a score. After twenty years, i.e. since the dawn of the Single European Market in 1993, the EU now covers barely 12 % of its annual consumption, as opposed to 18 to 20 % previously. Successive enlargements, commercial pressure from the dollar and ACP suppliers, and lack of competitiveness due to the production conditions and adherence to European social standards, have only curbed the EC supply. Fortunately, European solidarity has been brought into play, through the famous POSEI programme, enabling its production sector to partially make up the competitiveness deficit.

More generally speaking, we should remember that banana production in the French West Indies is threatened by the development of black sigatoka disease (BSD) or black cercosporiosis, which was first detected in Martinique in September 2010, and then in Guadeloupe in January 2012. For the moment, the sanitary condition of the banana plantations is still under control, despite permission for aerial spraying being withdrawn and the extremely limited range of treatment products authorised for combating fungus. Alternatives to chemical management are also being implemented, particularly via surgical leaf removal techniques. Finding themselves in the firing line, all producers are hoping for quick access to BSD tolerant or resistant varieties within a reasonable time frame.



Imports: at full throttle

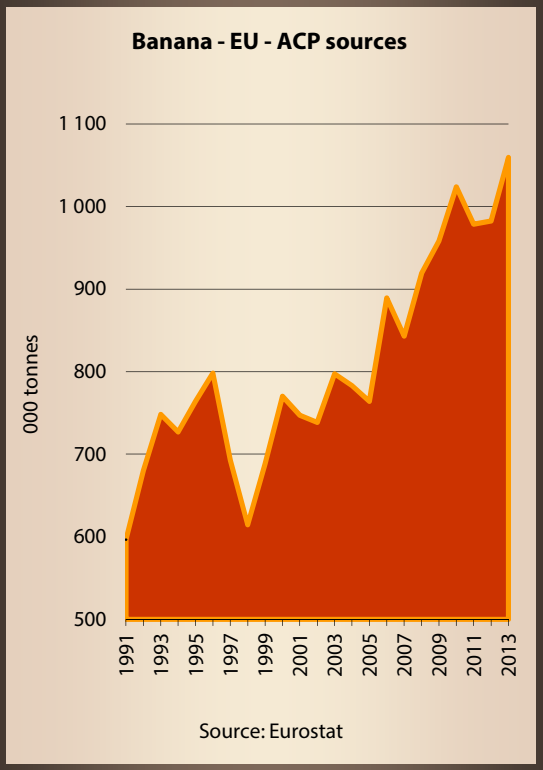
With a market share in excess of 88 %, and even rising by nearly 1 %, extra-Community suppliers to the EU have a stranglehold on the world's biggest dessert banana market. Imports have grown, taking advantage of successive enlargements, strong competitiveness and facilitated market access (elimination of restrictions, implementation of a tariff-only system associated with a scheduled reduction in customs duty, or for the ACPs unlimited market access). In terms of volume, imports in 2013 represented nearly 4.8 million tonnes, just short of the absolute record from 2008 of 4.9 million tonnes.

Dollar sources

Dollar sources, or MFN (as in the WTO term Most Favoured Nation), brought just under 3.7 million tonnes of bananas onto the European market in 2013. This was 300 000 t short of the absolute record from 2008, but nonetheless is a very fine performance compared to 2012. Indeed, the annual growth of 5 % is the strongest for six years.

The situation is mainly very simple for the dollar group. All the big suppliers increased their presence in the EU, except for Ecuador. And yet while the world's leading exporter and leading supplier to the European market eased off, it deed so on a very limited scale: - 1 % (- 19 000 t). As we will see in the analysis dedicated to the US market, this fall from Ecuador to Europe was more than compensated for by a steep increase in its shipments to the United States (+ 6 %, i.e. + 43 000 t). The number two and three suppliers, respectively Colombia and Costa Rica, are on the rise. Their performances were nothing exceptional, far from it, but there was indeed growth. Colombia registered slight growth of 2 %, i.e. two to three times less than the market trend, while Costa Rica rose more steeply, with a growth rate of 6 %, i.e. slightly more than the market trend, though to the detriment of its nearest destination, the United States.

Other suppliers, which represent in total just 12 % of the dollar supply, emerged much better. Panama, for example, increased its score by more than one third, to reach 194 000 t. We can also mention Peru, one of the world's two biggest sources of organic and fair trade bananas, which registered 28 % growth from 2012 to reach the 100 000-t mark. This figure is still provisional, since a statistical error passed on by Eurostat put the source as high as 143 000 t. Mexico has also burst onto the scene, going from less than 10 000 t in 2011 to 54 000 t in 2013. True, the source enjoys a zero-duty quota, but it is also a big fruit producing country which is waking up to banana exports to Europe, the United States and also Russia. Finally, among the secondary sources, we can also mention Guatemala, which tripled its shipments to the EU with 12 000 t (+ 171 %), though this is no big deal compared to its performance on the US market: + 10 %, with 1.6 million tonnes.



ACP sources

We might believe that this group of suppliers, enjoying duty-free access to the European market, was the big winner of this 2013 banana year. First of all, it did better than the market trend. Its volumes were up 8 %, exceeding for the second time the million-tonne mark to 1 059 000 t, for an absolute record! The previous record dated from 2010. With a 51 % market share, African suppliers took over from other ACPs from the Caribbean or Latin America. Côte d'Ivoire and Cameroon, the number two and three ACP suppliers, got close to or exceeded their absolute records thanks to growth rates of 12 and 17 % respectively. These producers have a strong dynamic, and even if political threats make long-term analysis difficult, everything is in place for Africa to continue its forward march (see **FruiTrop** no.216, November 2013). The number three African supplier, Ghana, showed signs of weakness in 2013 (- 16 %), tumbling below 50 000 t, largely because of social unrest.

Among non-African ACP suppliers, the situation is more mixed. Indeed only the Dominican Republic was up (+ 5 %), maintaining a level above 300 000 t and retaining its position as the number one ACP source. Exporting nearly three-quarters of its produce as fair trade and/or organic (see **FruiTrop** no. 200, pages 46 to 48), it picked up again in 2013 after a bad patch due to the climate conditions (prolonged drought) and phytosanitary problems. Belize and Surinam, the two other big players in the sector, saw their exports decrease by 3 %. Finally Surinam succeeded in privatising its banana industry, with the operator Univeg, and could go back up the rankings in 2014. The Windward Isles are suffering, despite an attempt to start over, and some good results for Saint Lucia. The presence of black cercosporiosis, the recurrent climate damage and competitiveness handicaps of these islands does not leave much hope for a dazzling resumption of exports. The aid promised by the EU under the BAMs (banana sector accompanying measures), which is currently being paid, could help the process.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Banana — EU-27 imports — 2013

tonnes	AT	BE-LU	BG	CY	CZ	DE	DK	EE	ES	FI	FR	UK	EL	HU	IE	IT	LT	LV	MT	NL	PL	PT	RO	SE	SI	SK	UE-27
Intra-EU total	**118 433**	**35 704**	**17 547**	**2 191**	**124 137**	**646 931**	**74 381**	**9 999**	**54 590**	**65 163**	**283 474**	**133 223**	**5 703**	**41 565**	**3 745**	**89 873**	**21 312**	**21 956**	**2 233**	**98 586**	**243 918**	**69 447**	**41 098**	**57 627**	**5 220**	**44 983**	**2 313 038**
of which NMCs12	**2 614**	**1 853**	**3 872**	**0**	**4 420**	**1 652**	**144**	**5 851**	**0**	**1 059**	**0**	**0**	**647**	**5 741**	**0**	**7 858**	**4 292**	**5 411**	**1 178**	**92**	**12 688**	**0**	**13 030**	**19**	**180**	**19 471**	**92 071**
Belgium	36 509	3 442	97	0	34 193	393 347	1 141	3 409	2 137	191	97 929	9 332	21	9 567	0	30 181	4 408	10 558	38	37 992	75 337	412	1 798	8 568	750	11 515	**772 873**
Germany	41 502	5 341	373	0	23 133	0	64 735	284	41	36 746	8 654	144	338	3 105	32	502	4 817	5 620	0	57 056	122 560	0	2 036	21 720	18	2 566	**401 322**
Netherlands	28 002	10 399	603	2	18 221	219 032	5 106	98	248	14 417	21 147	29 477	158	3 223	90	12 494	1 581	346	4	0	20 190	52	1 516	12 785	43	689	**399 925**
France	9 583	5 542	0	0	38 554	10 870	2 745	0	50 935	0	0	8 058	0	7 614	328	35 945	6 169	0	0	1 111	5 889	3 108	20 967	100	7	5 239	**212 764**
Spain	30	0	0	0	356	311	17	0	0	51	41 821	384	0	20	0	2 254	0	0	0	22	98	65 428	0	2 575	0	60	**113 426**
United Kingdom	0	9 043	0	0	2 553	3 231	72	0	207	0	79 091	0	0	4 133	3 294	120	6	21	0	1 494	6 828	42	0	486	0	2 497	**113 119**
Ireland	0	0	0	0	0	10 382	1	0	0	0	0	85 790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**96 172**
Italy	194	0	21	560	2 011	3 970	0	0	276	0	34 515	0	4 539	802	0	0	0	0	1 014	1	326	405	192	0	1 500	2 943	**53 270**
Czech Rep.	0	1 287	0	0	0	845	0	0	0	0	0	0	0	1 656	0	0	100	2 355	0	31	11 897	0	2 684	0	180	19 025	**40 060**
Sweden	0	0	0	0	335	2 202	394	168	0	12 699	247	37	0	0	0	0	39	0	0	45	0	0	0	0	0	0	**16 166**
Greece	0	0	12 581	1 629	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 500	0	0	0	**15 709**
Austria	0	0	0	0	361	1 382	1	0	0	0	0	0	0	7 359	0	519	0	0	0	538	0	0	59	0	2 723	5	**12 947**
Denmark	0	0	0	0	0	517	0	0	0	0	0	0	0	0	0	0	0	0	0	175	0	0	0	11 373	0	0	**12 066**
Slovakia	273	0	0	0	2 259	0	0	0	0	0	0	0	240	2 215	0	5 042	0	0	0	0	10	0	0	0	0	0	**10 039**
Latvia	0	0	0	0	0	107	1	5 309	0	922	0	0	0	0	0	0	3 120	0	0	0	0	0	0	19	0	0	**9 478**
Slovenia	71	0	3 034	0	0	0	0	0	0	0	0	0	0	1 645	0	1 486	0	0	0	0	38	0	2 399	0	0	202	**8 874**
Poland	242	44	552	0	1 631	701	72	0	0	0	0	0	0	225	0	512	1 072	377	0	21	0	0	2 325	0	0	146	**7 919**
Hungary	1 990	0	0	0	530	0	69	0	0	0	0	0	0	0	0	818	0	0	0	0	0	0	1 424	0	0	79	**4 910**
Bulgary	0	0	0	0	0	0	0	0	0	0	0	0	377	0	0	0	0	0	0	0	0	0	4 198	0	0	0	**4 575**
Lithuania	0	522	0	0	0	0	2	542	0	21	0	0	0	0	0	0	0	2 679	0	0	743	0	0	0	0	0	**4 507**
Cyprus	0	0	133	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	1 178	0	0	0	0	0	0	0	**1 319**
Portugal	0	31	0	0	0	0	1	0	746	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**784**
Finland	0	0	0	0	0	21	25	189	0	0	0	0	0	0	0	0	0	0	0	60	0	0	0	0	0	0	**295**
Romania	39	0	154	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	39	0	0	0	0	0	19	**272**
Luxemburg	0	54	0	0	0	14	0	0	0	0	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**130**
Estonia	0	0	0	0	0	0	0	0	0	116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**117**
Malta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total extra EU	**1 140**	**1 243 385**	**18 437**	**1 995**	**0**	**680 773**	**15 204**	**101**	**138 815**	**12 500**	**328 362**	**1 006**	**124**	**0**	**64 822**	**565 086**	**8 702**	**0**	**791**	**319 834**	**19 810**	**66 783**	**1 144**	**123**	**41 192**	**0**	**4 783 865**
of which MFN	**1 140**	**1 048 636**	**18 437**	**1 995**	**0**	**671 269**	**13 147**	**101**	**112 608**	**12 500**	**2 916**	**592 093**	**124**	**0**	**35 987**	**544 963**	**8 702**	**0**	**791**	**303 666**	**19 810**	**59 167**	**1 084**	**109**	**41 192**	**0**	**3 724 404**
Ecuador	41	253 474	16 434	1 995	0	353 039	0	101	9 821	5 923	798	147 619	89 903	0	209	207 350	6 162	0	532	118 590	12 967	7 401	1 084	24 131	31 674	0	**1 289 711**
Colombia	1 099	461 378	0	0	0	92 583	9 968	0	43 293	0	236	247 411	942	0	1 382	144 447	144	0	0	115 317	1 956	26 136	0	12 112	618	0	**1 159 020**
Costa Rica	0	176 738	0	0	0	126 316	1 343	0	39 965	4 085	1 621	157 954	20 404	0	30 723	158 021	1 169	0	83	11 600	4 744	22 939	0	55 900	3 713	0	**817 318**
Panama	0	52 049	0	0	0	72 601	0	0	922	0	0	27 484	7 975	0	0	13 310	311	0	0	1 878	144	41	0	17 488	0	0	**194 204**
Peru*	0	99 544	0	0	0	19 575	0	0	42	40	0	3 204	0	0	1 126	0	0	0	0	21 771	0	0	0	0	0	0	**145 301**
Mexico	0	4 387	0	0	0	761	0	0	9 706	0	83	0	0	0	0	11 557	842	0	176	23 788	0	2 650	0	20	0	0	**53 971**
Brazil	0	462	0	0	0	5 461	1 834	0	8 858	2 452	178	8 175	0	0	0	4 495	74	0	0	10 722	0	0	0	0	0	0	**42 712**
Guatemala	0	22	0	0	0	902	0	0	0	0	0	0	3 985	0	0	5 745	0	0	0	0	0	0	0	0	1 717	0	**12 371**
Honduras	0	102	0	0	0	19	0	0	0	0	0	247	879	0	2 519	0	0	0	0	0	0	0	0	0	972	0	**4 738**
Croatia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	2 499	0	**2 516**
Turkey	0	0	1 592	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1 592**
Philippines	0	480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**480**
of which ACP	**0**	**194 749**	**0**	**0**	**0**	**9 504**	**2 057**	**0**	**26 207**	**0**	**325 446**	**414 666**	**0**	**0**	**28 835**	**20 123**	**0**	**0**	**0**	**16 169**	**0**	**7 616**	**59**	**14 031**	**0**	**0**	1 059 460
Dom. Rep.	0	46 801	0	0	0	9 425	2 057	0	17 724	0	3 374	201 099	0	0	18	4 779	0	0	0	16 053	0	7 616	59	14 030	0	0	**323 034**
Côte d'Ivoire	0	58 793	0	0	0	4	0	0	4 522	0	122 756	65 447	0	0	0	654	0	0	0	0	0	0	0	0	0	0	**252 176**
Cameroon	0	73 463	0	0	0	0	0	0	0	0	105 323	59 164	0	0	0	11 173	0	0	0	116	0	0	0	0	0	0	**249 239**
Belize	0	117	0	0	0	0	0	0	3 962	0	0	63 868	0	0	28 817	0	0	0	0	0	0	0	0	0	0	0	**96 763**
Surinam	0	0	0	0	0	0	0	0	0	0	80 956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**80 956**
Ghana	0	15 533	0	0	0	1	0	0	0	0	13 037	10 565	0	0	0	3 476	0	0	0	0	0	0	0	0	0	0	**42 612**
St Lucia	0	0	0	0	0	0	0	0	0	0	0	12 367	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**12 367**
Dominica	0	0	0	0	0	0	0	0	0	0	0	1 442	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1 442**
Mozambique	0	0	0	0	0	0	0	0	0	0	0	523	0	0	0	40	0	0	0	0	0	0	0	0	0	0	**563**
St Vincent	0	0	0	0	0	0	0	0	0	0	0	191	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**191**
Uganda	0	4	0	0	0	74	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**80**
Burundi	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**37**
Rwanda	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**

* Peru: total currently undergoing correction (estimated at 100 000 t) / Abbreviated country codes as the per official EU standard / Source : Eurostat

Monthly supply tempo: nearly perfect

There was near-perfect growth in fruit brought to market! Looking solely at the import figures, there was a fall only in March, of just 1 % (2013 from 2012). Imports were up for all the other months, and sometimes even in big proportions, such as the last four months, when we saw volumes increase by between 10 and 18 %. The increase was more reasonable in the first part of the year, and stable in the summer months. And no need for jealousy, as both the dollar and ACP supplies increased all year round, both generating end-of-season pressure.

If we add European produce to the imports, nothing really changes. And if we compare this supply with a 2010-2011-2012 three-year average, we obtain exactly the same annual profile. All of which comes down to saying that there was a clear, massive increase well distributed over the year ■

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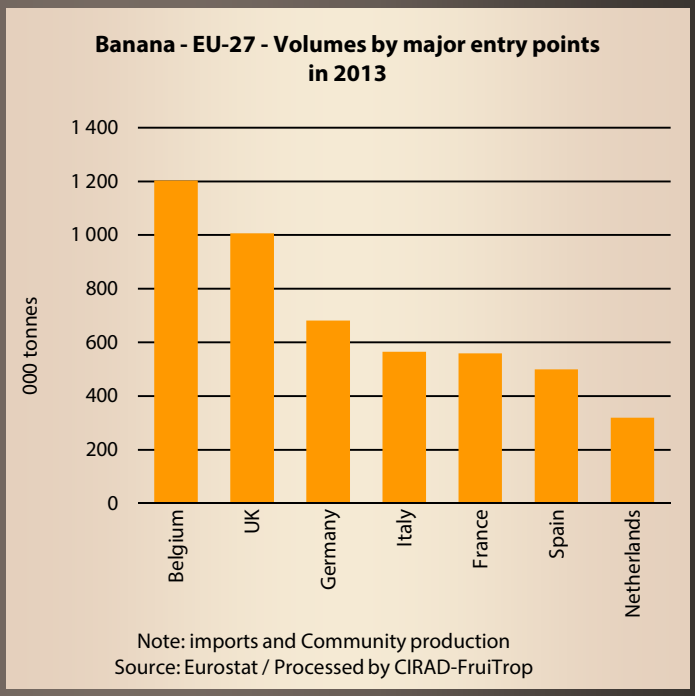
Banana entry points and circulation within the EU

There is nothing new under the sun for Europe. The bananas consumed by the 500 million Europeans are still coming in via the same doors, with Belgium, the United Kingdom, Germany and France controlling three-quarters of the flows.

The banana is also a well-travelled fruit within the EU. If we add to these volumes (third-country imports + European produce) trade between Member States, we get some phenomenal figures. Indeed the banana trade, in the broad sense of the term, involves 7.7 million tonnes! As a reminder, consumption is estimated at just 5.4 million tonnes. Again, Belgium, the United Kingdom, Germany and France are the main hubs of this market.

By way of example, France handles more than 840 000 t of bananas on its territory, whereas its consumption is around 560 000 t. There is an even bigger gap is for Belgium, whose ports attract import flows of 1.2 million tonnes, whereas its consumption does not exceed 50 000 t.

So there is large-scale circulation between Member States, though we do not necessarily know the source of the produce in circulation. Indeed, customs authorities lose the point of departure or, more precisely, no longer systematically specify it once the merchandise is in free circulation in an EU State. That is a shame for analysis of consumption by source, and also because we are utterly incapable of detecting double counts. Nonetheless, analysis is possible in bulk, though often hard to pin down. Here is an example for the twelve New Member States (NMS-12): we calculated their consumption at approximately 570 000 t, for 100 million inhabitants. This supply is clearly from the EU-15, with approximately 579 000 t, to which we need to add 93 000 t, originating directly from third countries. The NMS-12 re-export a very small quantity, of around 1 600 t, outside of the EU, and 104 000 t to the European Union.

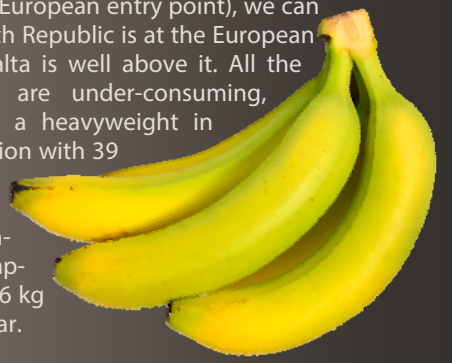


Note: imports and Community production
Source: Eurostat / Processed by CIRAD-FruiTrop

New EU Member States

If we can believe Eurostat, consumption by the twelve New Member States (NMS-12) was up 4 % in 2013 on the 2010-2011-2012 average. It represents a market of 100 million inhabitants, of around 570 000 t. It is relatively complex to evaluate because of the supply originating nearly exclusively from other European Member States. So we will use the average as a basis for checking whether the orders of magnitude are adhered to. The three-year average is actually around 530 000 t. The NMS-12 account for just 2 % of extra-EU imports for the EU-27, but take in a quarter of intra-European trade. This trade is tricky to identify, and double counts are possible. Annual consumption per capita is still below 6 kg, and well below the European average, estimated in 2013 at 10.7 kg.

It is a highly heterogeneous group. If we exclude the actual or "statistical" big consumers, Cyprus and Slovenia respectively (European entry point), we can say that the Czech Republic is at the European average, and Malta is well above it. All the other countries are under-consuming, such as Poland, a heavyweight in terms of population with 39 million inhabitants, yet which registers a consumption of approximately just 6 kg per capita per year.



Banana — European Union — Evaluation of supply — Tonnes

Year	Banana type or source			Sub-total	Exports	Net supply
	Community	ACP	Others ($)			
1988	719 270	514 061	1 644 100	2 877 431	17 265	**2 860 166**
1989	698 925	544 441	1 716 175	2 959 541	13 415	**2 946 126**
1990	710 635	621 875	2 024 248	3 356 758	36 219	**3 320 539**
1991	695 402	596 416	2 286 019	3 577 837	53 468	**3 524 369**
1992	711 191	680 191	2 365 883	3 757 265	39 689	**3 717 576**
1993	646 242	748 120	2 219 721	3 614 083	36 138	**3 577 945**
1994	584 622	726 927	2 102 303	3 413 852	58 044	**3 355 808**
1995	658 206	763 886	2 405 180	3 827 272	43 082	**3 784 190**
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	982 391	3 511 553	5 142 403	5 349	**5 137 054**
2013	614 564	1 059 273	3 684 203	5 358 040	9 106	5 348 934
	(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-27 member countries and then exported outside EU-27.
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 / Since 2007: EU-27. The study concerns extra-Community import data for ACP and dollar bananas and re-export. The rules of operation 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 / Processing: CIRAD Market News Service

The banana in Croatia

Croatia became the EU's 28th Member State, as of 1 July 2013. To facilitate the calculations, the results set out in this dossier exclude this country's trade; its figures will be incorporated from 2014. The Croatian banana market amounts to around 50 000 t. It is a dollar banana market, more particularly Ecuadorian bananas (75 % market share in 2012), with Costa Rica, Panama and Colombia rounding off its supply. Since enlargement, a small proportion of the supply has switched to intra-European traffic, mainly from Belgium and Slovenia (port of Koper). Even since enlargement, there have been no re-exports from Croatia to other EU States, except in July 2013 with just over 1 200 t to Slovenia.

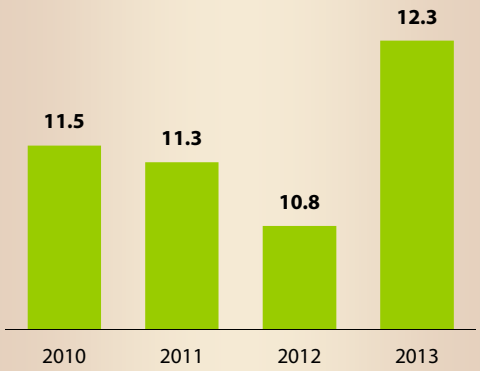
The annual consumption per capita was around 11 kg, but in 2013 it climbed to 12.3 kg, putting Croatia in the leading group of European consumers.

Banana - Croatia - Imports

Tonnes	2010	2011	2012	2013
Total, incl.	**49 355**	**48 531**	**46 161**	**49 249**
Intra-EU	**19**	**117**	**138**	**4 454**
Belgium	0	0	0	3596
Slovenia	0	0	0	688
Italy	0.1	1.8	138	97
Extra-EU	**49 355**	**48 531**	**46 161**	**49 249**
Ecuador	39 804	36 217	34 684	32 152
Costa Rica	3 499	4 286	3 600	10 307
Panama	311	1 380	5 242	3 333

* intra and extra EU-28 from July 2013 / Source: Eurostat

Banana - Croatia - Apparent consumption in kg/capita/year



Source: Eurostat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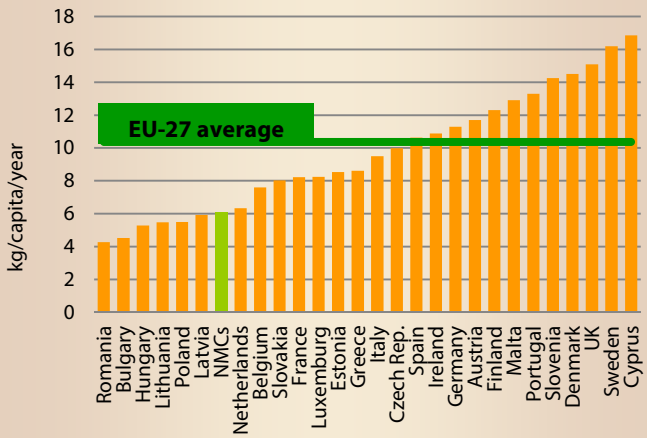
Consumption in the EU

European banana consumption rose steeply in 2013. It gained 400 grams per inhabitant, reaching 10.7 kg, but is still a long way off the record from 2008, when the 11-kg mark was reached. The average since 2007 (last expansion) is 10.5 kg. It is very tricky to try to calculate consumptions per capita in a European Union where flows between States are not 100 % reliable, where the presence of entry points sometimes distorts the statistics (e.g. Koper in Slovenia) and finally where the customs services do not always have the same degree of efficiency. Nonetheless, over the long term, and being very cautious in the assumptions adopted in the statistical calculations, we can draw up a map of banana consumption in the EU.

Looking at the result, there are some unavoidable conclusions. First of all, being a producer does not mean that you consume more bananas. Indeed, it is almost the reverse which applies. France and Greece are two very good examples in this respect, consuming practically 2 kg less than the European average. However, Spain is in line with this average. Portugal and Cyprus do much better than the average, with respectively 13.3 and 16.9 kg per capita per year.

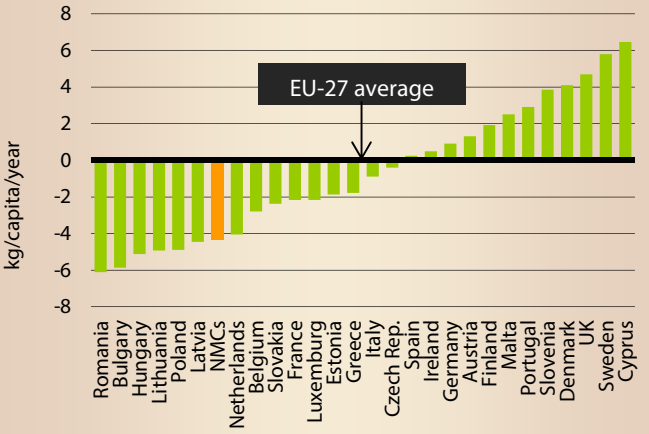
The other lesson relates to the extreme variability of the results. Various parameters come into the reckoning in terms of understanding the consumption levels in each country: size of fruit range available, attractiveness of retail price, consumption promotions, eating habits, etc. Hence the NMS-12 consume well below the European average, whereas Sweden and the United Kingdom are very big banana consumers. The gap is enormous. For the United Kingdom alone, the consumption is 4 to 5 kg more per capita per year. As a reminder, each additional kilogram per European equates to additional banana demand of 500 000 tonnes. Therein lies the solution for maintaining the world banana balances over time. And since a dream is half the reality, it is now up to the industry players to fulfil their half of the bargain.

Banana - EU-27 - Consumption
Estimate using a reduced average (40 %)
for the period 2004-2013



Note: the results are uncertain for some member countries
Source: CIRAD-FruiTrop / Experimental work

Banana - EU-27 - Consumption in 2013
over and under-consuming member countries



Note: the results are uncertain for some member countries
Source: CIRAD-FruiTrop / Experimental work

The banana in Germany

Banana consumption in Germany is approx. 20% higher than in France, if we take the house-hold panels of the two countries as a basis. The last ten years were however not a very successful period for bananas on the German market. Quantities bought by German households decreased 2.7 % per annum, which is slightly more than the decline of fresh fruit in general (- 2.0 % p.a.). Foreign trade statistics depict a slightly friendlier picture, but the general trend of available quantities remains negative. However 2013 saw a slight recovery of household consumption (+ 2.9 %). Bananas benefited from the high prices for all other fresh fruits. While average consumer prices for bananas increased by 3.0 % in 2013, the average price for all other fruits without bananas increased by 8.7 %.

The banana market in Germany is very price driven. Discount stores have a share of 58.6 % of the total quantities sold. But a few years ago this share was even in excess of 60 %. Non-discounting supermarkets made some gains after 2009 ; their share in sold quantities now amounts to 36.8 %. 11.4 % of all bananas sold in Germany were organic bananas in 2013. This market share has increased again slightly, after having stagnated from 2010 to 2012.

Like with all fresh fruit banana purchases increase with increasing age of the households. But compared to fresh fruit in general this dependency on age is less pronounced. Households with small kids buy 30 % more bananas than average households. This may be part of the problem, because Germany has very low birth rates, so there are less "customers" ■

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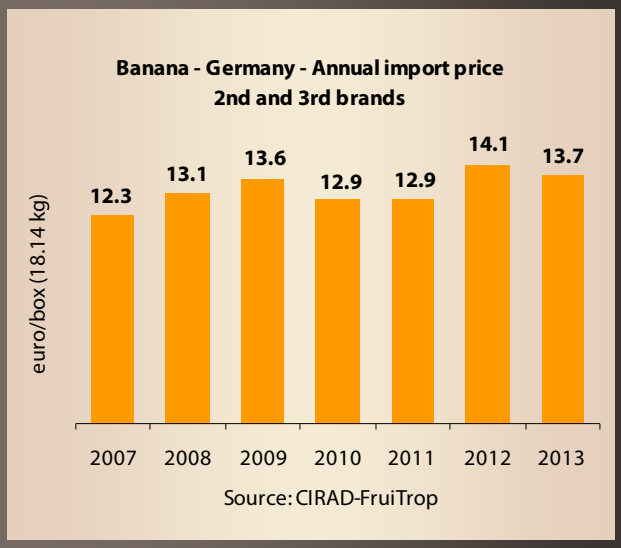
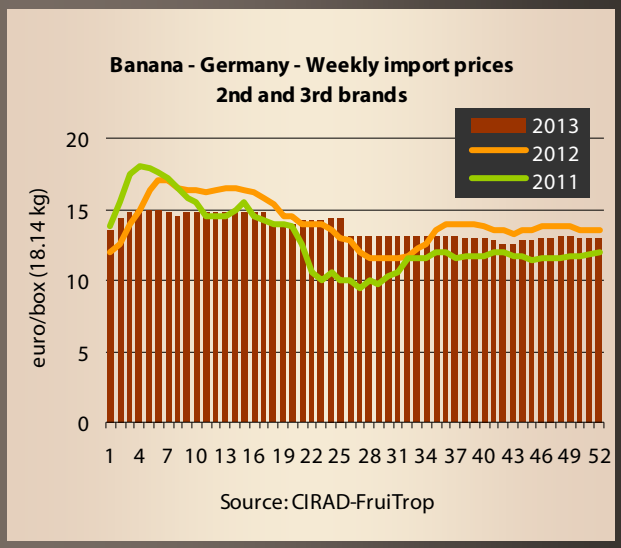




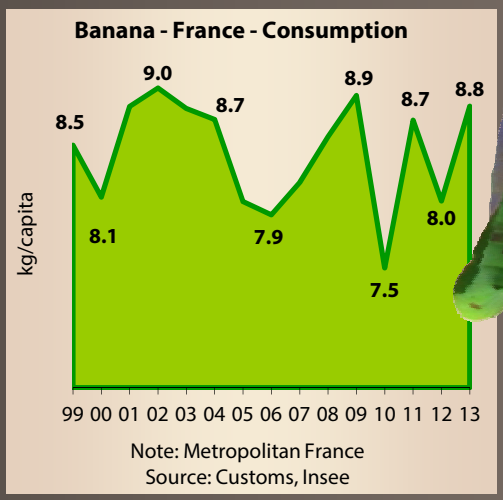
The banana in France

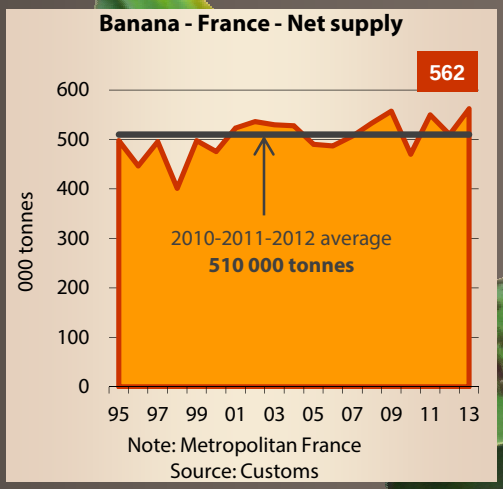
Hip-hip hurray! Banana consumption in France is rising steeply - no French exception in this case. Its trend is following that of the EU, and indeed doing better. Each French consumer scoffed 8.8 kg in 2013, i.e. 800 g more than in 2012, and 400 g better than the ten-year average. Yet it was not an absolute record: the 9-kg mark was achieved in 2009.

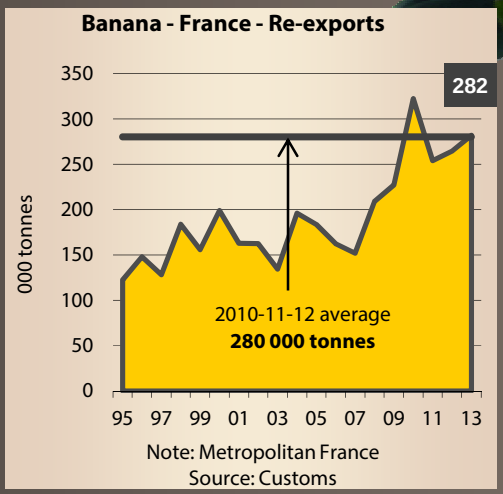
In terms of absolute value, the French market in 2013 was estimated at 562 000 t, i.e. an increase of more than 52 000 t, and 10 % from 2012. This very steep rise should be put into perspective, with the growth of 5 % observed for the EU-27. All the same, this excellent news for France has not been shared by all the industry players. Some believe that, if there has been a rise, it is less steep than the figures seem to indicate. Others confirm the trend, pointing out that the dollar banana pressure was higher than observers were able to gauge. The results of the Kantar panel also confirmed the very positive market trend. In the fruit world in 2013, the banana, as well as the orange, exotics and avocado, were the only products to emerge with more consumers buying more of them. All the other fruits, due in particular to high prices and lower availability, had fewer consumers, who also bought less. The panel announced a rise in banana purchases of 4 % by volume and 8 % by value. Although there is some discussion about the figures, in every case the dynamic is definitely there, ranging from medium intensity to high-intensity - and that is something to celebrate.

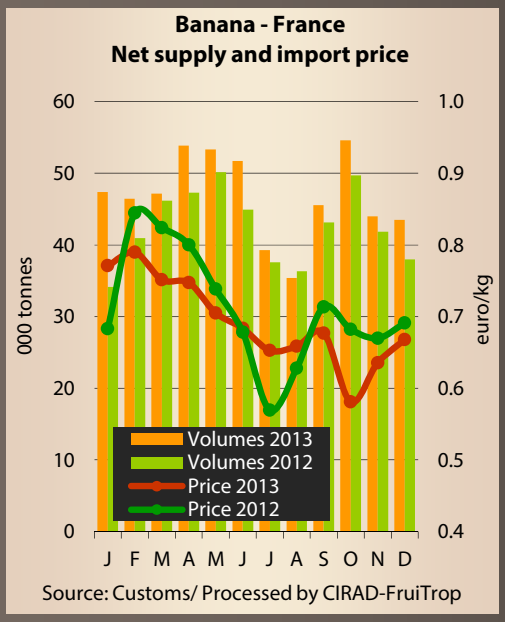
More from the ACP and dollar groups

The structural analysis of the supply to the French market reveals some particularly interesting developments. The dollar sources saw a dazzling rise (+ 40 %) in 2013, reaching 78 000 t. True, they are still very much in the minority on a market where African and FWI-produced French bananas have a market share of more than 80 %. However, various operators are seeing this growth in this supply, mainly from Colombia (+ 58 %), Ecuador (+ 40 %) or Costa Rica (+ 5 %). Direct imports from the ACPs went up by 9 % between 2012 and 2013. Côte d'Ivoire literally exploded in 2013, with its deliveries to France climbing 37%. Cameroon followed the same trend, with a 13 % rise, while Surinam (- 5 %) and the Dominican Republic (- 13 %) slipped. French production from Guadeloupe and Martinique was down 8 %, for Martinique under the effect of the consequences of Cyclone Chantal (2013). Yet France was also supplied by the other Member States. This is where we lose the notion of produce source. We know







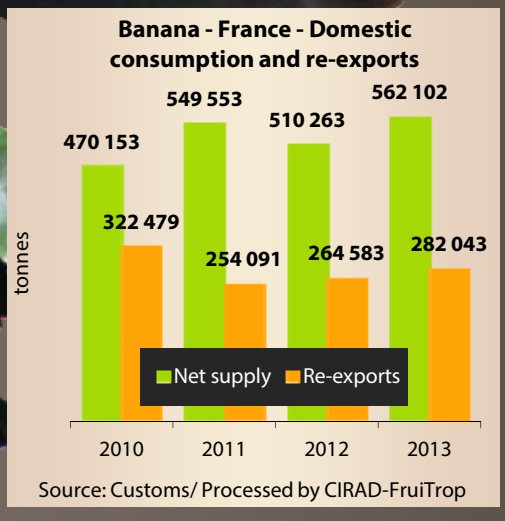


Source: Customs/ Processed by CIRAD-FruiTrop

that 18 000 t were brought in via Spain, and we also know from experience that they were not Canaries bananas, which are kept within the Iberian Peninsula. We might believe that they were dollar bananas, but cannot say for certain. Overall, it was the United Kingdom that proved to be the big purveyor of bananas of uncertain provenance. Cross-Channel flows doubled between 2012 and 2013, reaching 55 000 t, and now represent 58 % of the total volume entering France. So a total of 94 000 t was brought into France, i.e. up 50 % from 2012.

Hence the gross supply (imports from third countries + French produce + transfers via Member States) increased by 9 % in 2013, reaching the exceptional figure of 844 000 t. We should recall that net consumption was just 562 000 t. The remainder was obviously re-exported, making France one of the four big European redistribution platforms, after Belgium, the United Kingdom and Germany. So re-exports, always very large since 2008, amounted to 282 000 t, representing a 7 % increase on 2012, but in line with the three-year average.

The supply tempo to the French market in 2013 was comparable to the EU supply tempo. March, August and September brought rather small volumes. All the other months saw big rate rises from 2012, and also from the three-year average. We should note the fever pitch of Cameroonian volumes in October 2013, which disrupted the market for several weeks.



Source: Customs/ Processed by CIRAD-FruiTrop

Good trend yet to be confirmed

Because there is always a fly in the ointment… we cannot say, based on just one year's figures, that France's consumption level is now converging toward the European average. Indeed, as we were saying in our January price review (see **FruiTrop** no.218), the basics of the French market have remained unchanged. We should make no mistake. It was the conditions of the sector driving consumers towards the banana, and not a sudden burst of marketing or merchandising efforts, or even smart market management between all the industry players. The main thing in all this is to have shown, unwittingly, that it is possible for French consumption to break through the 550 000 t glass ceiling. The Banana Interprofessional Association (AIB), which brings together all the sector players, has begun its work and should be up to speed by the end of 2014. We wish it every possible success, in getting past the individual interests of each party, to build a better future for the benefit of all. All the best from us for its contributors.

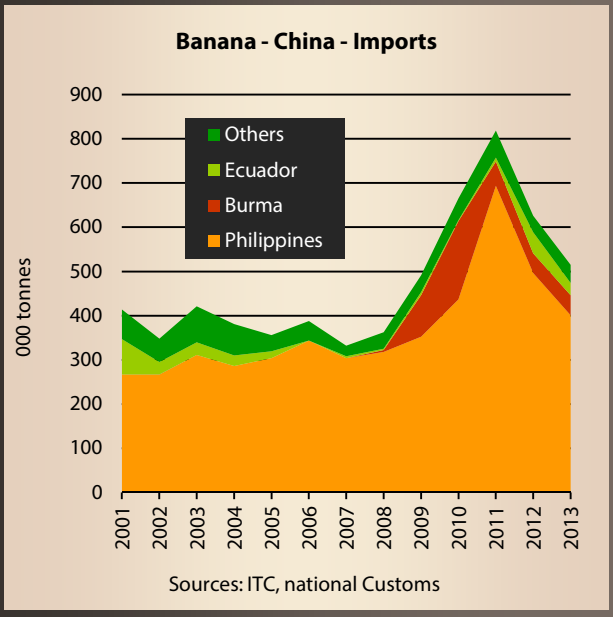
The banana in China

A big producer country (approximately 10 million tonnes), China is still a relatively modest importer in terms of consumption potential, especially in 2013 when import volumes barely exceeded a half-million tonnes. Difficulties with Philippine production doubtless played a role in this under-achievement. On average, China has imported 700 000 t of bananas per year since 2009, when the import market seemed to awake, after a long period stuck below 400 000 t per year.

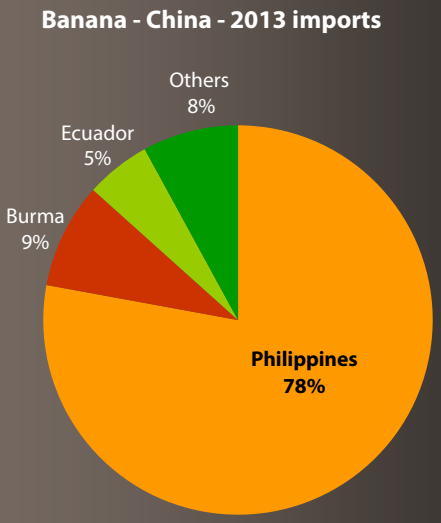
The Philippines has a market share of 78 %, while Burma (Myanmar), Ecuador, Thailand and Vietnam round off the supply. We can observe that the total flow per source is very up and down from year to year. Burma went straight from 177 000 t in 2010 to less than 50 000 t in 2013.

Banana — China Producer regions in 2010 (million tonnes)	
Guangdong	2.8
Guangxi	1.9
Hainan	1.5
Yunnan	1.2
Fujian	0.7

Source: Bananalink, 2012



Sources: ITC, national Customs



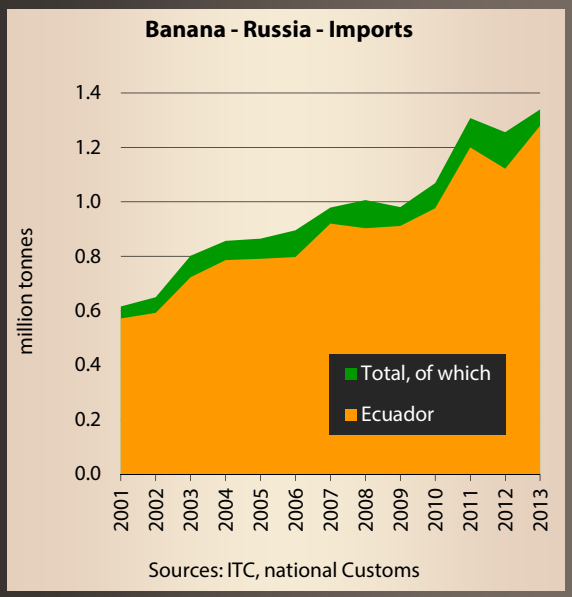
Sources: ITC, national customs

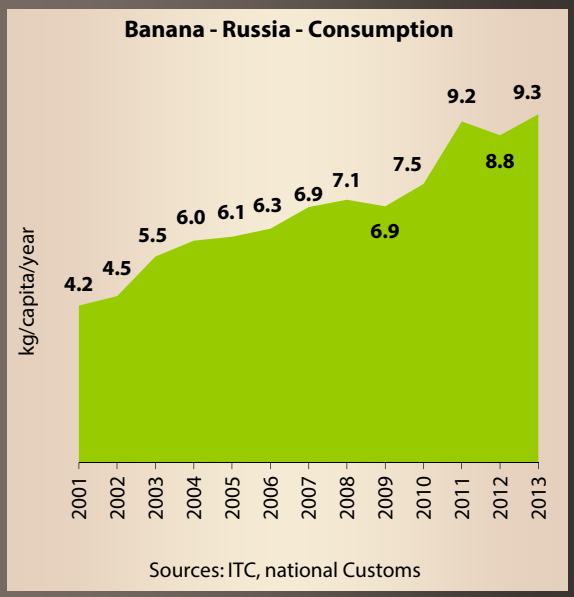
The banana in Russia

Russia is a one-track market, with its supply based entirely on a single source: Ecuador. Although the Ecuadorian government wants to tame its export sector, there are large areas of loose practices. And the Russian operators, who have purchased vast plantations in-situ, are not bothered about the rules. Ultimately, the Russian market gets 97 % of its supply from Ecuador. This is a huge outlet for the world's leading exporter, which moreover is constantly growing. In 2013, imports reached 1 339 000 t, up 7 % from 2012 and 11 % on the three-year average. The market is seeing very steady growth, more than doubling in size within a dozen years. Following on behind is the Philippines, but with very limited volumes of around 24 000 t. Costa Rica, for a long time the number two supplier, has largely withdrawn from this destination. It actually delivered just 17 000 t in 2013, as opposed to 80 000 t in 2012. Hence Ecuador has strengthened its grip on the Russian market. We should also note in passing the symbolic presence of Mexico, at around 3 000 t, which is definitely firing on all cylinders, with exports rising on all markets: EU, United States and now Russia.

The supply tempo to the Russian market is not very different to the European markets. Nonetheless, we can observe a slightly less marked seasonality, especially over the spring period when large quantities of banana are put on the market. 2013 was a very busy year over the first five months, then June, July and August were well below average, with a recovery from September to November. December was a rather light month. As we mentioned in our January 2014 edition, the massive quantities delivered at certain periods push the market past bursting point. This was the case for example in September and October 2013, when prices plunged to previously unexplored depths.

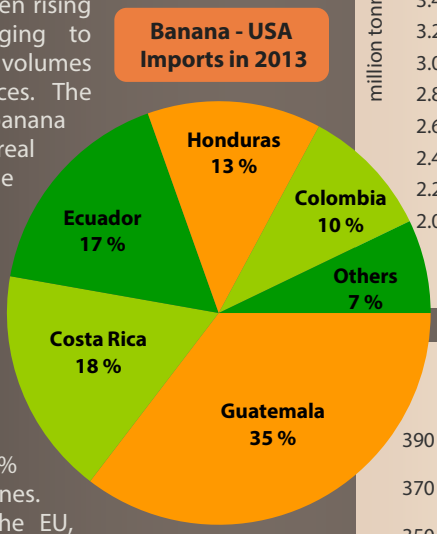
The consumption per capita doubled between 2011 and 2013, from 4.2 to 9.3 kg per year. The falling population trend has not yet had enough of an effect on the consumption trend, which remains on a resolutely rising trend. The development of logistical infrastructures and modern distribution centres throughout the country should help prolong this dynamic. Russia's biggest supermarket chain, Magnit group, has also fully understood the benefit of this fruit, relatively easy and inexpensive to handle down the chain. According to our partners from Reefertrends.com, taking advantage of the fall of the JFC empire, the group has gained 20 % of the import market in the space of two years, fully adopting the trend of direct purchasing from the producers in the production zones, in this case in Ecuador. Similarly, it organises the transport by chartering specialised reefers.





The banana in the United States

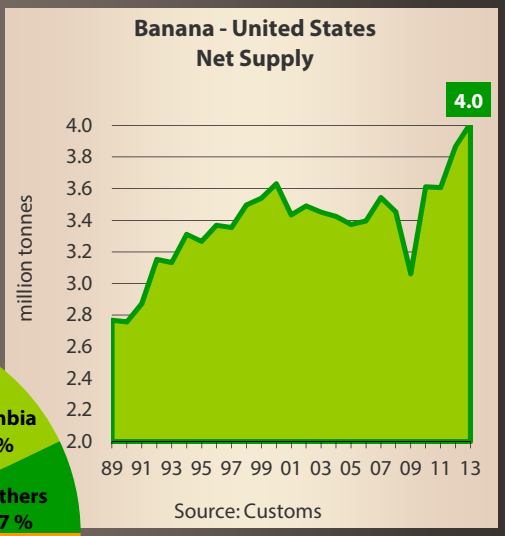
The record for the overall supply to the US market has fallen! The symbolic 4-million tonne mark was finally reached in 2013, with the market increasing by 4 %. This is in line with the increase in the other big import markets, except for Japan. Alongside this, consumption climbed to 12.5 kg per capita per year. This is still 300 g below the previous record from 2000, but let's not spoil the fun. The US market has been rising constantly for years, managing to square the circle: increasing volumes without harming import prices. The peculiar structure of the US banana market is without doubt a real economic anachronism in the land where free enterprise reigns.

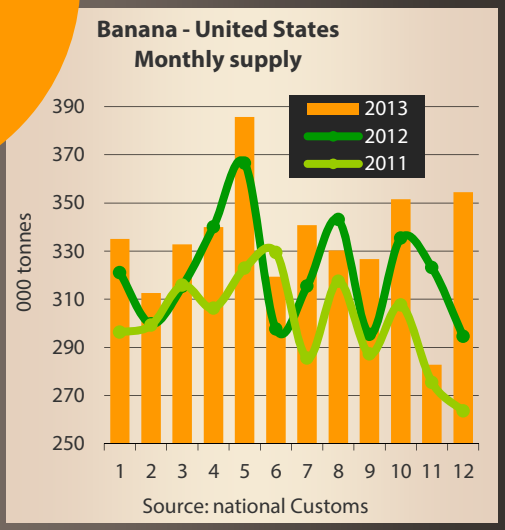


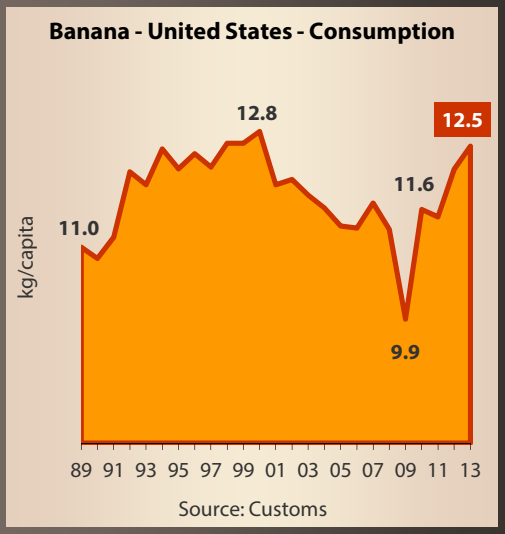
Apart from Costa Rica (- 7 % from 2012), which traded off toward the EU, all the big sources were up. Leading the way in first place, Guatemala consolidated its market share, increasing its shipments by 10 % to more than 1.6 million tonnes. Ecuador, in poor shape in the EU, increased by a lively 6 %. With + 3 %, Colombia did not quite match the market trend. Secondary sources such as Honduras and Mexico, definitely the source on the rise, recorded growth rates of + 13 and + 15 % respectively. We should note the strong percentage growth (doubling), though still weak in terms of absolute value (less than 6 000 t), of the Dominican Republic on the organic and fair trade segments, while Peru stood still at 22 000 t, its average over recent years.

The annual increase in consumption was well distributed over the year. There were two months exempt from the upward trend: August and November.

Finally, US Customs had an innovative 2013, distinguishing between organic and conventional bananas. This came as some surprise, a singular event. According to official data, organic banana imports represent 25 % of the total volumes entering the United States, i.e. 1.8 million tonnes. That is two-and-a-half times the market share of organic fruit and vegetable sales in 2012 (source: Agence Bio). Either the banana is an exceptional case, or the statistics are wrong, or for the United States organic certification does not exclude much, such as phytosanitary products usable in the plantations. The initial data for 2014 indicate that the Customs are in the process of putting things right. For the first two months of the year, the share of organic bananas out of the total US imports came back to more reasonable levels of 12 to 14 %.



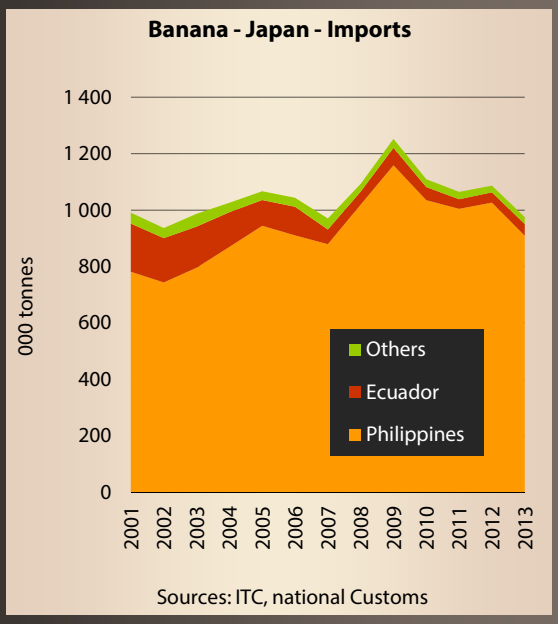




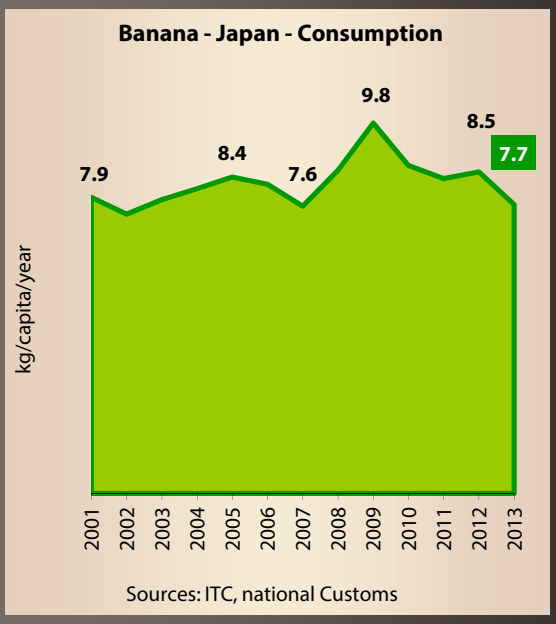
The banana in Japan

While the world banana market seems to be on the path of growth, the same does not apply to Japan. The import record from 2009 of 1.25 million tonnes will stand for a long time yet. 2013 was a terrible year, with imports dropping back below the million -tonne mark, with just 975 000 t. In fact it would be an error to analyse the Japanese market without analysing the Philippines supply, which hogs 93 % of Japanese demand. This source, the world number three exporter, is at the mercy of climate vagaries, particularly typhoons. 2013 was particularly difficult for the Philippines from this point of view, which was manifested in the Japanese foreign trade figures. For lack of supply, the market lost more than 100 000 t. Ecuador is the number two supplier, but far behind with just a 4 % market share. It stagnated at around 40 000 t, a long way off its performances in the early 2000s of 171 000 t! Taiwan and Peru have niche markets of 6 000 to 7 000 t each. Guatemala has also emerged. Practically absent in 2012, this source, which is causing a stir in the United States, brought 4 000 t to the market in 2013.

Consumption per capita is in freefall. In 2013 it was 7.7 kg, as opposed to 9.8 kg in 2009.



Sources: ITC, national Customs



Sources: ITC, national Customs

Chiquita-Fyffes merger

What consequences for the markets?

It's not every day that the fruit world witnesses a large-scale merger. The buzz from March's announcement of the alliance between Chiquita and Fyffes has not yet died down, so great are the repercussions for the sector. The deal is not yet done (anti-trust proceedings), and we can only conjecture as to what development model this fruit giant will opt for. This month, FruiTrop asks for the thoughts of two heavyweight experts of this industry: Benjamin Paz, academic, consultant and a former player on this market within the sector's biggest companies, and Richard Bright, a historic partner of our review, as well as founder and coordinator of the information site reefertrends.com

Overhauling the Banana Supply Chain

The recent announcement of the Chiquita and Fyffes merger is bound to bring a ripple effect to the entire banana industry – an industry in desperate need of restructure.

However, what could be the effect of such fresh fruit megamerger?

Could the banana supply chain be strengthened? What are some possible ramifications or competitive reactions?

Banana supply chain: historical perspective

The roots of the commercial evolution of the banana industry dates back to the Nineteenth Century, when the predecessors of what is now Chiquita singlehandedly transformed a backload cargo shipping business into a multibillion dollar fresh-fruit business. It created one of the most consumed fresh produce items in the world.

For decades, Chiquita was the banana supply chain. The company was vertically integrated and created formidable barriers-to-entry. It allowed its smaller competitor Standard Fruit & Steamship Company (now Dole) to survive to show a semblance of competition. Chiquita's well-crafted market position eventually drew antitrust attention and in a landmark case, the US government forced Chiquita to sell some of their banana landholdings, creating what is today known as Del Monte Fresh Produce.

Chiquita had great leadership. It had selected some of the most fertile soils in Latin America with high production yields and port-of-exit proximity; it operated the Great White Fleet which was the envy of the shipping industry with their reliable service and on-time performance; it distributed and ripened their product and ensured optimum placement in the retail displays. There was no doubt the company commanded a premium. Retailers were willing to pay for the quality and the service that the Chiquita brand represented.

Ultimately, it was their success that made the company a target of financial pundits and its complacency in response to competitive challenges led to its diminished industry role. The company started an asset selling binge that dates back to 1960, a policy that fragmented the banana supply chain structure that it had once owned and operated. The business model that had brought the company to world class status was shattered. The problem was obvious to everyone – except maybe to their owners and shareholders. There is something fundamentally wrong, when a leading fresh-food company has more lawyers than PhDs and many more accountants than agronomists, and worse, when they represent the majority of the top leadership roles at the company.

Reviewing the last ten years' performance of the key banana companies, the companies can be grouped in two basic camps. In one camp, we have Chiquita and Dole struggling. Chiquita had to restructure in 2002 after it had to file for Chapter 11 bankruptcy protection. A couple of years later, it fell into the same perils of the past. Dole went private around the same time but it had to come back as a public company because it was unable to service its secured debt to remain a viable business. After staving off its creditors and selling its Far East business, Dole has discarded its public shareholders once again and is back as a private business.

In the other camp, there were companies that had visionary leadership and have done well. For example, there is Sumifru, a small Asian company that is growing and competing for market supremacy in Japan and South Korea, while Compagnie Fruitière is a company that has slowly grown to be the largest producer and distributor of ACP banana production and acquirer of strategic distribution assets that Dole was unable to properly manage.

Del Monte Fresh, shielded by their pineapple success, has shown management leadership and is arguably the best-run company of the large multinationals. Another company that bucked the trend is Fyffes. Although run by lawyers and accountants, I believe they have followed the visionary stewardship and business model of the company patriarch, Mr Neil McCann. The companies Fyffes have bought are financially restructured but they have left the operating people to run the companies. A similar strategy seems to be pursued by its sister company Total Produce plc.

Today, the value proposition of the multinational companies is being severely challenged. They are the weakest link in the banana supply chain. More than ever before, their retail customers believe they can do a more effective and efficient job going to source directly and their banana suppliers believe they can also do a better job going directly to market. The situation is aggravated because there is not a clear product differentiation between the different brands coming to market. Quality differences primarily boil down to the quality packing specs, such as finger size and allowing more old peel scarring defects. Today, the supply chain is more fragmented than ever before. The only exception is the US market where the 3 large multinational companies still control over 87% of the market volume.

Fruits — North America market — Average retail prices

in USD/kg	1990 Actual retail price	2012 Price projection using CPI	2012 Actual retail price	Percent price change above or below CPI
Bananas	1.02	1.79	1.33	- 35 %
Red Delicious apples	1.59	2.78	3.04	+ 9 %
Thompson seedless grapes	2.77	4.87	5.48	+ 11 %
Anjou pears	1.68	2.95	2.76	- 7 %
Navel orange	1.26	2.20	2.32	+ 5 %

Note: original retail prices in USD per pound but converted to kilograms (1 kg = 2.20462 pounds) / * CPI: Consumer Price Index / Source: US Department of Labor, Bureau of Labor Statistics

Fresh fruit — North America Market
Consumption per capita use

Traditional fruits	Actual 3-year average (kg) 1990-92	Actual 3-year average (kg) 2010-12	% growth
Bananas	11.6	11.6	-
Apples	8.6	7.1	- 17 %
Oranges	5.1	4.6	- 10 %
Grapes	3.4	3.6	+ 7 %
Peaches & nectarines	2.7	2.0	- 27 %
Pears	1.5	1.4	- 6 %
Grapefruit	2.5	1.2	- 52 %
Plums & prunes	0.7	0.4	- 50 %
Total	**35.9**	**31.7**	**- 12 %**
	Decline	**- 4.2 kg**	

Growth fruits	Actual 3-year average (kg) 1990-92	Actual 3-year average (kg) 2010-12	% growth
Strawberries	1.6	3.4	+ 114 %
Pineapples	0.9	2.7	+ 195 %
Avocados	0.8	2.2	+ 182 %
Tangerines & tangelos	0.7	1.8	+ 150 %
Mangoes	0.3	1.1	+ 243 %
Cherries	0.2	0.6	+ 250 %
Blueberries	0.1	0.6	+ 550 %
Papayas	0.1	0.5	+ 450 %
Total	**4.7**	**12.9**	**+ 176 %**
	Increase	**+ 8.2 kg**	

Impact on consumers

Consumers in traditional markets have greatly benefited from the consistency and execution of the banana supply chain. They have had access to an uninterrupted supply of a nutritional quality item at a very competitive retail price. However, comparing the historical price escalation of bananas vis-à-vis other fresh fruits, bananas have not kept up with the retail price increases of other competing fruits. Bananas have not even kept up the historical cost increases of the average food basket. For example, let's compare the price performance of the most typical fruit items consumed on the US market (see tables).

The same holds true in most European countries. The relative price difference is magnified if you consider a fruit like the Red Delicious apple, which is declining in market appeal as customers seek other newer tastier varieties (e.g., Fujis & Galas), but it has been able to increase their retail price above the CPI trend.

The retail fresh-produce section is becoming more competitive. Bananas and other traditional fruits are facing steeper competition from other fruits that are rapidly growing in popularity.

Banana — North America 2013 retail prices				
	USD/lb	USD/kg	EUR/kg	EUR/box
East	0.65	1.43	1.05	18.96
Mid	0.53	1.17	0.85	15.49
South	0.57	1.25	0.91	16.52
West	0.67	1.47	1.07	19.49

Note: Original retail prices in USD per pound but change to kg (1kg = 2.20462 pounds) and an exchange rate of 1 EUR = 1.37 USD / Source: US Department of Labor, Bureau of Labor Statistics.

Banana — European Union 2013 retail prices				
	Average range		Mid-point	
	EUR/kg	EUR/kg	EUR/kg	EUR/box
Discounter	0.53	1.17	0.85	15.49
Soft discounter	0.57	1.25	0.91	16.52
Supermarket	0.67	1.47	1.07	19.49

Source: trade publications

A similar trend is developing in most key European markets. Total fruit consumption in North America is up; but in Europe total fruit consumption is down and banana consumption has been stagnant or slightly down.

Most fruits are more expensive than bananas. The problem for bananas is that over time the price differential has increased, but without a significant increase in banana consumption. Even in recessionary periods, competitive banana prices have not convinced customers to increase banana consumption by switching to bananas from other, more expensive fruits.

The European banana market has become highly fragmented and very competitive. The banana retail selling price at discounters such as Aldi or Lidl is similar to the average retail price in the North American market – a market without import duties and closer to source.

The EU discounter retail prices are not sustainable in the long term. For example, CIRAD reported that the average import green price per box paid in Germany in 2013 was EUR 13.70 — down 3% from the 2012 price of EUR 14.10. If you subtract from this wholesale price all the direct out-of-pocket fruit costs: EU import duties, discharge handling cost, shipping liner rate and if we assume the average FOB price to export a Costa Rican banana box, the resulting gross margin is less than 10% — a thin margin to cover: overheads, demand/supply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risk imbalances, selling cost and returning a profit contribution to shareholders for the risks taken.

It will be difficult to increase retail consumer prices. Historically, the industry consolidation has not been capable to pass on input costs to wholesale price increases. Once again, the key problem today for the banana supply chain is not necessarily coping with raising input or sourcing cost increases, but the industry's inability to increase the wholesale prices to their customers accordingly. Thus, the retail price has remained stagnant and has forced the traditional banana companies to scale down their European operations.

Lower banana retail prices have enabled a shift in consumer behavior by buying their bananas at discounters rather than supermarkets. However, as you can see in the banana consumption chart above in the total EU-27 and German markets, lower retail prices have not stimulated greater consumption. It is evident that at a certain price level, bananas have shown clear demand inelasticity. Consumers are happy to pay lower retail prices but there is little historical evidence that lower prices generate greater banana consumption.

Ultimately what increases banana consumption is location on retail displays, product accessibility, proper ripening color and quality appearance, and future attributes that could stimulate greater banana consumption.


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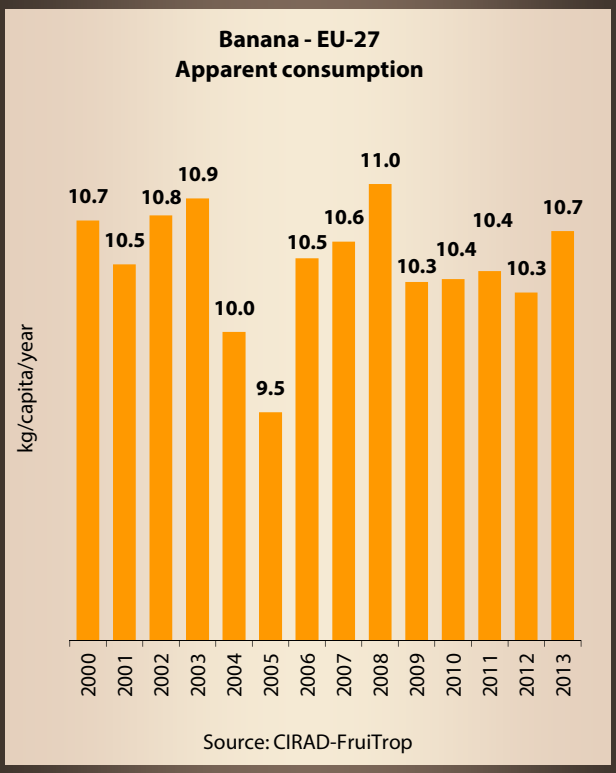

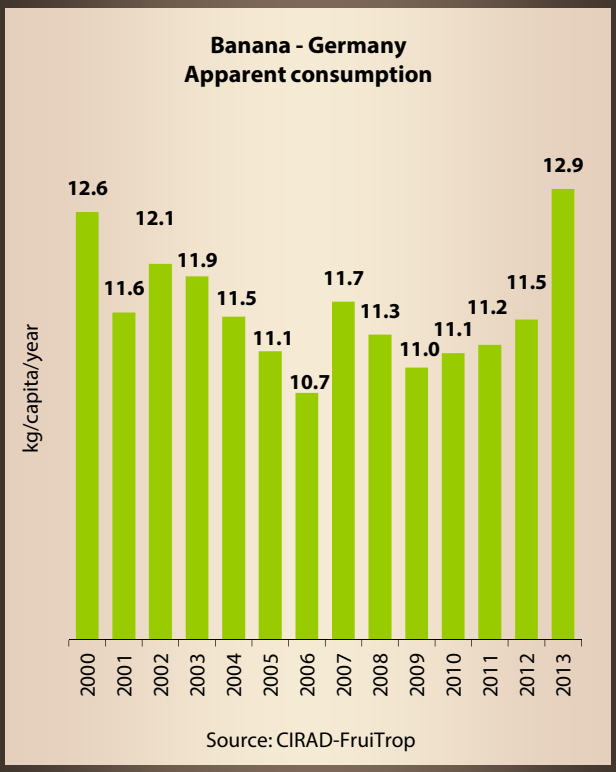

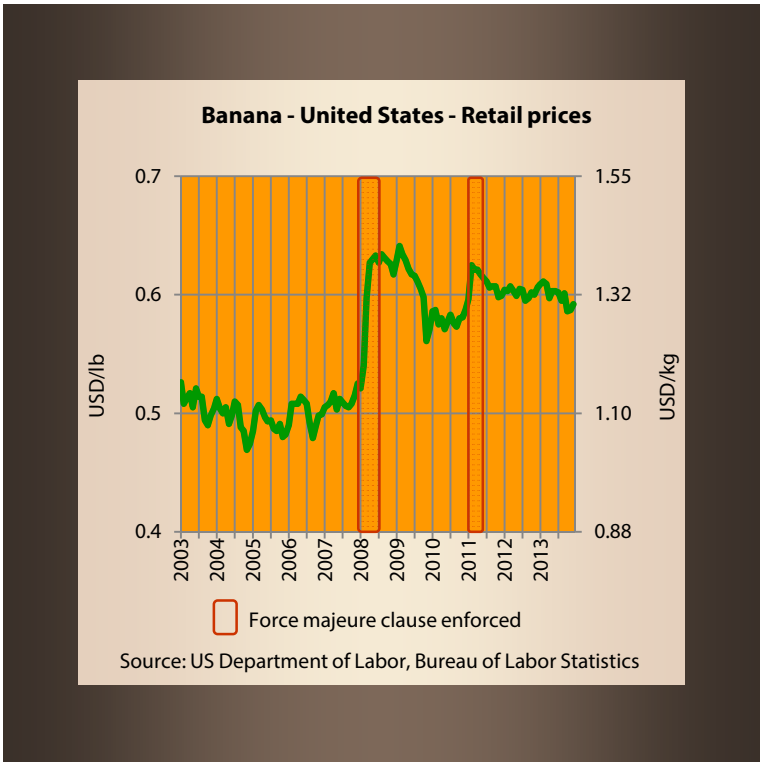

Impact on retailers

Retailers have been the clear supply chain winners in recent years. The banana gross margins achieved by retailers are greater proportionally than the gross margin of any other supply chain member. In North America, the retail gross margin in bananas is close to 50%. Large supermarkets in Europe selling above EUR 1.35 per kilo has even higher gross margins not discounting the VAT.

Retail purchasing power has greatly affected the banana industry. Even in the US where the multinationals have a combined market share of about 87%, they have been ineffective in raising wholesale prices. Their ineffectiveness is not only due to the purchasing power of retailers but also to their inability to differentiate and compete on any basis other than price. It seems the only time the multinationals have been able to raise prices has been after a force majeure event.

Retailers in Europe, especially discounters, in 2013 started to raise retail prices to their customers but simultaneously paid lower wholesale prices to their suppliers, thus increasing their contribution margins. This practice appears set to continue into 2014.

To improve their profitability, almost every retailer has embarked on a direct procurement strategy and launched their own private label, directly competing with their branded suppliers and thus following classic disintermediation strategies. Strategically, I believe, retailers have allocated a disproportionate amount of time and resources in controlling inputs rather than focusing more and more on what really matters, their customers.

Technological changes and marketing evolutions will bring alternate ways to distribute and ways for customers to source their food retail needs. It would behoove retailers to build closer alliances with their suppliers as a way to improve the value proposition to their customers, rather than competing against them.

Banana industry consolidation will not do much to diminish retail power, unless the banana players themselves start changing their value proposition to retailers. Retailers should be careful integrating backwards to direct procurement.

Retailers should consider two key questions. Is a direct fresh produce procurement strategy adding customer value? Is it really improving their contribution margins? I believe this strategy is doing neither. Retailers are simply substituting themselves, as the new banana companies, by building huge organizational overheads, taking unnecessary risks and not allocating the incremental cost solely to the direct sourced items.

Impact on shipping liner operators

The banana industry has been one of the most difficult business segments to crack for large liner shipping operators. Shipping costs represent a significant portion of the banana cost structure. Historically, shipping logistics was one of the most important capabilities the banana companies had. It enabled them to differentiate themselves, and capture better margins by providing a better service to their worldwide customer base.

Shipping liner operators have been a catalyst that has fragmented the banana market primarily to the European markets. The market share reduction of the multinationals in Europe is directly correlated to the increase in banana cargo space gained by liner operators. The reason is simple: a small fruit trader sourcing 1 000 banana boxes per week from Ecuador could gain access to the European market at a total delivered cost per box that is at least as competitive as the delivered cost a large banana company could achieve delivering from the same source

250 000 boxes per week. The liner service growth left the multinationals without an important economy of scale advantage.

Shipping lines trying to gain cargo share in the banana business have quoted very competitive prices. They have also improved their delivery service — in addition to offering access to multiple ports of entry, reducing domestic distribution logistics cost. All banana companies have scaled down their operations and have started shipping with liner operators. Originally, multinationals tried to lock some of the space available to block potential smaller competitors. But what happened instead was liner operators added more services and increased the cargo lift capacity. However, at least for the foreseeable future, based on existing port facilities, liner operators have reached size and draft capacity limitations and are finally learning about the real cost of dealing in the reefer cargo trade.

Banana industry consolidation may not be beneficial to the liner operators. I believe the first inclination of the banana companies would be to set their core shipping business to key ports of entry. The balance and seasonal adjustments could be done with liner operators. It is possible that one of the major shipping companies may gain an advantage if they lock a contract with a large supplier, but there are too many other players and it is not clear if it would be a long-term advantage. Smaller importers will still have market access using other carriers at similar competitive freight prices.

The opening of the new Panama Canal service to large vessels and the potential investments in sourcing port terminals will make the shipping liner service very competitive. The banana cargo share of the shipping liner companies will continue to increase and it will be harder for the trend to be reversed. There will be room for specialized or company owned vessels, but in the long-term the bulk of the trade to Europe and eventually to the US market will be on liner services.

Impact on independent wholesalers

The number of independent banana wholesalers has greatly diminished in the North America market. The remaining wholesalers still thrive primarily in large metropolitan areas where efficient fruit distribution is vital. In Europe, wholesalers still play a major role in the banana supply chain distribution, especially with the growth of large discounters. Mergers like the Chiquita-Fyffes announcement should impact wholesaler trade the most.

I expect that there will be a series of cooperation agreements between wholesalers and production companies as they both try to reposition themselves by securing sourcing and distribution advantages. Future technological changes could further diminish the role of wholesalers with post-ripening improvement — such as container fruit ripening.

An added wholesaler benefit has been prepacking bananas to retailer specifications. There is a belief that prepacking is a value-added product improvement. I question that belief. For starters, it adds to the waste disposal of the pre-packing material which is counter to the environmental initiatives most retailers are touting to follow. It does not improve the quality of the product but adds to the cost. Even when consumers pay for the service, it could also limit potential consumption increases. If the prepack or bag extended the banana yellow-life, it would be a value-added feature, but the prepack/bag does not help the nutritional value for the customer, and the industry is forcing customers to pay for needless benefits. Even if supermarkets are capturing some incremental margin, the only benefit may be using pre-pack bananas as a way to differentiate themselves from other competitors. This benefit is marginal especially after every retailer follows the same strategy. It results in just an added cost, questionable benefits and possibly cannibalizing banana sales.


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Impact on other banana companies

The effect of a Chiquita-Fyffes merger may not be felt in the short term. The immediate strategy of most competing companies may be a wait-and-see attitude. The new management team will face major internal challenges — trying to merge both companies successfully. It will not be a quick-fix.

The relationship with retailers and growers should not differ significantly from their current approach. ChiquitaFyffes will attempt to reposition their brands by segmenting the market – trying to cater to every form of banana distribution. It will be interesting to see how they are going to differentiate the product specification to command a price differentiation structure among the different market segments.

All competing companies will review their process performance to ensure they will remain viable and ready to react to market opportunities as other players struggle. Companies with strong leadership like Sumifru, Compagnie Fruitière and Fresh Del Monte should benefit from the merger. On the other hand, larger companies like Dole could be impacted because, today, they are perceived as the company with the weakest management focus.

In the short term, I do not see smaller traders and fruit importers diminishing their current role in the banana trade. Companies trading in Russia and Mediterranean markets should not be impacted in the near future. However, their fruit sourcing may be limited to Ecuador, if the multinational companies lock up even further the fruit availability in Central America and Colombia.

The delivered cost of Ecuador to different markets will continue to be an issue, due to the incremental shipping cost and Canal transit. In the long term that could be a competitive disadvantage, especially if there is a continued escalation in fuel cost.

Impact on banana growers

Based on recent comments by the management of the large multinational companies, all of them want to increase the ownership of their banana production. On the surface, it seems like a logical strategy. In the last few years, the gross margin achieved by efficient growers (i.e., growers with scale and productivity yields of over 3 000 boxes per hectare) have been better than the gross margins achieved by the multinational companies in their best markets. Additionally, most large independent growers have better quality than the produce achieved by company farms.

Today most large growers have all the necessary certificates to compete in any market. All farms are improving productivity as a way to reduce cost, but most of the gains have been made by packing 2nd-class quality fruit. The total box yield per hectare has increased but yields of the 1st-class fruit are about the same or, in many cases, lower.

Banana technological improvements have been limited. If you walked into a banana farm ten years ago and then a similar farm today, you would see little to no change. However, if you walked through an apple farm ten years ago and visited a similar farm today, you would see a significant difference. Apple farms have improved production yields with high density planting which has also improved fruit quality and coloration. Banana research has been limited. The R&D departments of the major companies are a shadow of what they once were. Banana plantations today reflect the lack of innovation. The ChiquitaFyffes management team should refocus on improving pre- and post-harvest techniques. The industry should not ignore the impact of new banana diseases, like the slowly but expanding new strain of the *Fusarium* fungus.

Company consolidation could mean cancelling of some grower contracts. However, the danger is if a multinational cancels a contract with an independent grower, the cancelled contract does not mean that the production will disappear. The grower will seek other buyers. The cancelled contract will create more competition in the marketplace, especially when there are no major market barriers-to-entry and the new competitor will remain viable unless the large banana companies have a competitive advantage. To Europe such advantages are limited and in emerging markets are non-existent.


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Expanding banana plantations

The average capital cost to plant a new hectare of bananas is at an all-time-high. Depending on the location, the cost of land could fluctuate between USD 10 000 to 20 000 per hectare. The infrastructure cost and pre-production cost could be as high as an additional USD 15 000 to 20 000 per hectare. Assuming a minimum ROI (return on investment) of 10% and assuming the new area produces 3 000 boxes per hectare, it means the new area should generate a farm cash-flow of USD 0.80 to 1.30 per box — achieved by the company paying to their farms the same purchase price it would have to pay for the same fruit box from an independent grower.

Based on historical performance, the multinationals have not been able to achieve that performance consistently; therefore it could be better for the multinationals to consider continue purchasing from independent growers and use the capital resources in other value-added projects where the companies can achieve a better ROI.

Adding more production by planning new areas will add to the current banana supply. Unless there is an increase in banana consumption or new markets discovered, the incremental supply will add to supply and demand imbalances. Remember, the population growth and banana consumption in traditional markets has been negligible in the last ten years.

The most significant demand growth accomplishments have been the opening of the Russian and growth of Middle East markets. Volumes to those markets have significantly increased and have been able to absorb production growth. Without both markets and assuming the current banana consumption in traditional markets would the same as today, many traders and growers would have gone out of business.

The potential growth market is China. However, the Philippine producers have already increased their production capacity to meet this need. Production in the Philippines has grown faster than the market growth in China. Banana imports to China have slowed down, as the Chinese government has imposed some entry restrictions. Latin American and African production cannot compete on a sustainable basis in the Asian market because of the logistics and transportation differences. Additionally, many other Asian countries are ready to start production if the growth of the Chinese market materializes.

What to expect for the near future?

A potential improvement will be if the ChiquitaFyffes management team takes on a leadership industry role.

The potential of the banana business will continue. Banana consumption should increase with an aging population seeking longer-term health benefits and a rapidly expanding middle class in developing countries. There is no doubt that fruits and vegetables are the vital nutrients to improve wellness among all consumers. The industry will need to focus on the attributes of the product and should be more actively promoting fruit consumption. This task requires leadership. There are many stakeholders willing to collaborate in improving the penetration of fruit as the best snack for nutrition and health benefits.

If the new ChiquitaFyffes management team does not take on this challenge, the benefits that this merger could potentially bring to the banana industry would sadly evaporate — potentially leading the new company to the similar path of prior management, but this time with less chance of turning the company around.

The banana business model is ripe for change. However, it will take visionary leadership to make the change happen ■

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ChiquitaFyffes — good fit or no synergy?

Superficially the merger of the two banana 'majors' to create the world's largest integrated banana marketer ChiquitaFyffes makes sound commercial sense: above the line there are clear synergies to be had in sales geographies and brand and product strategy, while below the line there are significant cost savings to be made in logistics, marketing/distribution and SG&A.

However the merger poses almost as many questions as it provides solutions for the two multi-nationals. Although neither Fyffes nor Chiquita is in imminent danger of failure, the merger is more of a defensive manoeuvre than it is a grab for growth. According to their annual reports, operating margins have been shrinking: Chiquita's from 3.5% in 2004 to minus 0.1% for 2012, and Fyffes' from 4.4% to 3.5% over the same period.

Background

There are several reasons for the fall – most importantly the competitive landscape has changed significantly in the past decade in terms of both supply and demand. A structural oversupply of fruit has kept pricing in major markets under pressure, while the dramatic growth in container shipping coupled with certain carriers' commitment to develop a 12-month banana business has allowed those retail customers who were previously dependent on the big brands for their bananas to go direct. Under these circumstances none of the majors has been able to meet shareholder expectations. Consolidation should halt and possibly reverse this trend – this is because while the deal has advantages for all the majors at either end of the chain, it will also become more difficult for large retail customers to source independently…unless they pay more for their fruit or create more efficient, lower cost supply chains.

Neither will be easy: with Colombia and much of Central American banana production already owned or under contract to the majors, there are no alternatives open to US or EU retailers keen to develop in-house sourcing programmes other than Ecuador. Ecuadorian bananas may have the advantage in terms of shelf life, but they are at a significant competitive disadvantage in terms of distance (transport, fuel, Panama Canal) and tariff costs when benchmarked against their Latin American rivals. There is also what can euphemistically be termed a 'mindset gap' between the Ecuadorian producer/exporter and European customer and while this might be resolved in the longer run, as will the import tariff, the other disadvantages will remain.

Change management

In terms of corporate culture, Fyffes is expert in assimilating the companies it acquires, largely because it retains key staff and adopts a 'hands-off' approach to the day-to-day management of the new business. And although this is quite the reverse of a

Fyffes takeover, it will be the Fyffes executive team that is responsible for driving the business forward. For despite having sales of half that of its rival and a substantially lower market capitalisation, Fyffes managed to extract the most senior executive roles for its management: Fyffes CEO David McCann is to be CEO of ChiquitaFyffes, while colleague Tom Murphy is to be CFO. The Fyffes crew also got the COO role, which goes to Coen Bos.

Chiquita apparently had little choice but to swallow all of this because of its very high debt levels – US$660m, or more than 10 times that of Fyffes. Then again, of all the majors Fyffes is the only company to consistently trade its bananas profitably - and in the EU, the world's most sophisticated and toughest banana battleground. The real decision-making power of the new organization will be on the eastern seaboard of the Atlantic for the right reasons.

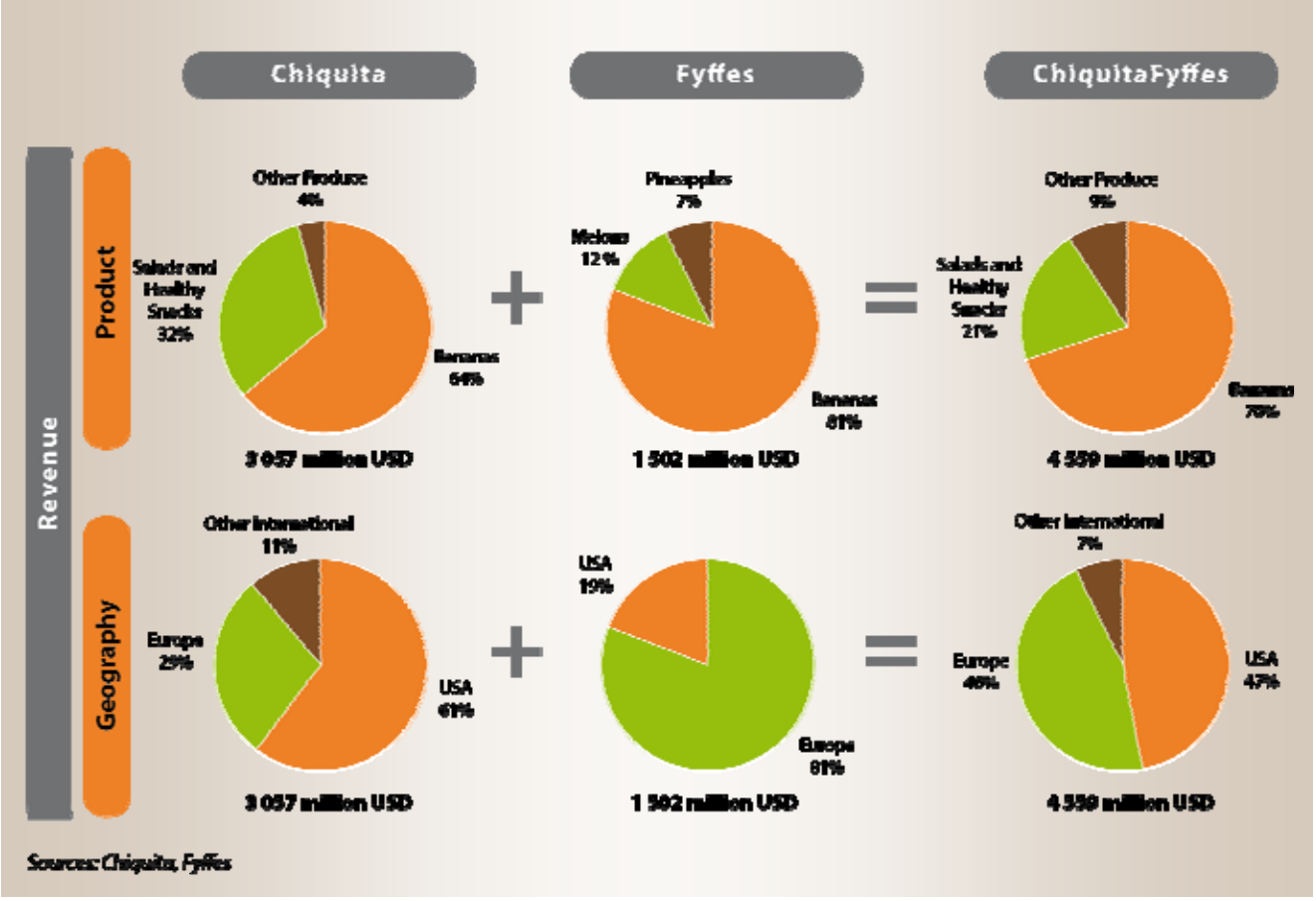
The first priority for Mr McCann will surely be to eliminate all cost duplication as the company settles into a new structure. It is unlikely that many changes will be made to the respective shipping arrangements in the short term, largely because there are a number of long-term charters already in force. If the new organization can reconfigure service strings to co-load cargo, a modal switch back to the specialized reefer for transatlantic voyages remains a possibility. Then again, the combined volume makes the company an attractive target for the container lines.

Markets

The US market is currently stable and growing – in 2013 Chiquita sold 56% of its total bananas into the US, 1.5 mill. more boxes than in 2012. In contrast its banana sales in the EU fell 1.3 mill. boxes over the same period. Of the two in the US, Fyffes (Turbana) has a much smaller share – distributing about 11 mill. boxes of a total 250 mill. It also sells melons and pineapples, an area in which Chiquita is not an active player. If the current Fyffes executive team holds sway it would not be a surprise in the longer term to see the new company sell off Chiquita's Fresh Express subsidiary to focus on exotic fruit, much in the same way that Total Produce was de-merged from Fyffes in 2006. Both Fyffes and Total Produce have performed better apart since then than ever they did together.

As a result of the merger there could potentially be a significant contraction in the number of banana brands marketed in the US next year. If the Turbana and Banacol brands are retired or lost and the future of the Bonita brand remains uncertain or unresolved, the US will be dominated by Dole, Del Monte and Chiquita. This brand rationalization may encourage US retailers to step up their efforts to circumvent traditional channels and go direct.

The combined company will look to expand in parts of Asia and the Middle East where banana consumption is relative-



ly low and on an upward curve. Fyffes has little-to-no experience in these markets - neither does it in the volatile Eastern Med where the majors and the traders fight for custom.

Of all the trade battlegrounds the most immediate and largest changes are likely to take place in the EU. If Chiquita has greater penetration and knowledge of the US, Middle East and Pacific Rim markets, Fyffes is the master of the European banana trade. Theoretically there should be marketing synergy but the statistics in isolation belie some important considerations. As Chiquita sees its high end, 'niche' brand proposition struggle against the tide of European customers switching to low-cost, no-name commodity bananas, Fyffes has adopted a mass market volume strategy, keeping it conservative and focusing on a lean supply chain. How ChiquitaFyffes will address this cultural and/or brand divergence remains to be seen. And will Mr McCann maintain the respective N Cont HQs in Rolle and Rotterdam or bring everything under one roof?

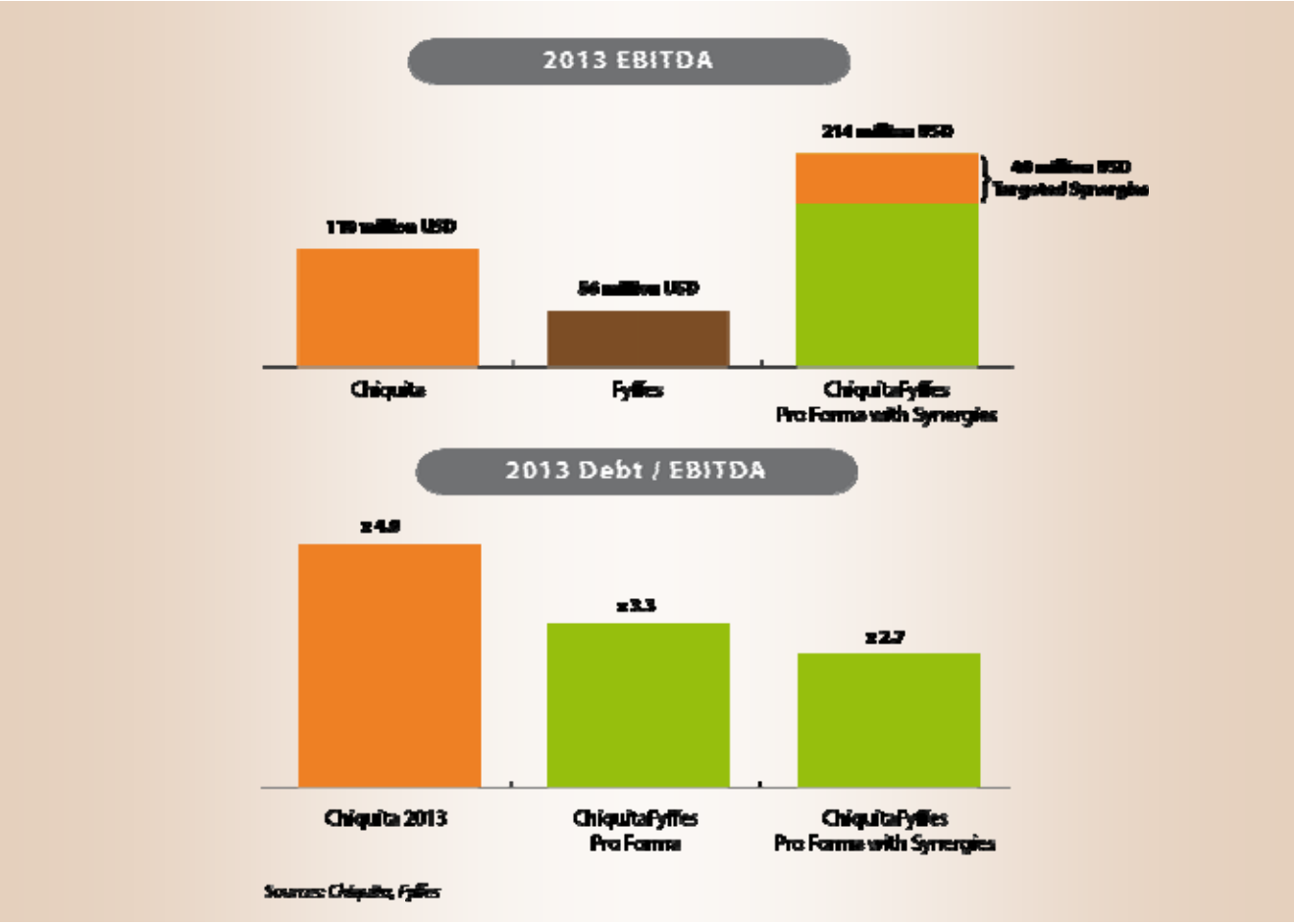
What is also likely to change is the position of banana 'pretender' Univeg, which acts as service provider, ripener and distributor of Chiquita bananas. If Chiquita fruit is to be distributed via Fyffes' European supply network from January 2015 onwards, Univeg which has only recently completed the acquisition of SBBS in Suriname for EUR 22 mill., will have to look elsewhere for throughput.

Production

At the head of the banana chain Chiquita owns and operates plantations in Costa Rica, Honduras, Panama and Guatemala. The bananas grown in Honduras and Guatemala Chiquita ships to the US, Panamanian fruit goes to the EU while Costa Rican fruit is sold into the US, EU and Mediterranean markets.

Fyffes does not operate any of its own banana plantations, but rather acts as a contract buyer and distributor. Chiquita does something similar in Ecuador for its USWC and Med customers. For its pineapples and melons Fyffes has adopted a different strategy, investing in farms in Panama and Costa Rica.

While it seems unlikely there will be any change in the short term, one country more than any other stands to benefit most from the merger. President of Unibán, Colombia's largest banana shipper, Luis Fernando Arango says the merger of the two multi-nationals 'will build market opportunities for Colombian banana exports'. The combined volumes of Fyffes and Chiquita totalled 20.5 mill. boxes in 2013, of which Fyffes accounted for 20 mill. boxes. But if ChiquitaFyffes is to take more fruit from Colombia, another source will have to be sacrificed. This presumably will be Ecuador.

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Pricing

When asked for its opinion, the Fairtrade Foundation said that the merger would only serve to squeeze banana producers further. How so? While the merger will certainly cut costs, it should give all the major players and not just ChiquitaFyffes greater opportunity to leverage their equity and increase the price charged to customers. Theoretically the more rationalized the supply base the more rational the supply, and consequently the greater the influence each of the remaining suppliers has in determining pricing behaviour.

Very simplistically, if this holds true and retailers do pay more, the producers at the head of the chain should be in a position to receive more, not less, a result that is compatible with the Fairtrade Foundation's aims. If however ChiquitaFyffes chooses to pass on the benefit of its position to shareholders and not the producers it will be pilloried and vilified - with the Fairtrade Foundation doubtless at the front of a queue of critics.

An increase in profitability and value is vital for the global banana industry. The only way in which the banana business will be sustainable in the long term is if funds are re-invested to find more environmentally compatible methods of production and to combat the diseases that are already threatening the Cavendish variety with extinction, if we believe what we read. As long as there is retail-led, carrier-supported destruction of value along the banana supply chain, the emphasis in cash crop management will be on ever-more intensive production and disease treatment methods. Over time such exploitation will deplete natural resources, weaken ecosystems and poison those communities near to production areas that are dependent on the banana industry for survival.

In terms of performance Fyffes appears to be able to generate a profit despite the banana price wars raging among retailers in the UK, its largest market. In Continental Europe, things are changing: given that it is one of the four principal banana suppliers to German discounter Aldi, it will be interesting to hear the analysis of its H1 results and the guidance it gives on H2 when it reports on the first six months trading later this year. The Aldi price is significant because it is the benchmark against which other European retailers measure their pricing.

The Aldi averaged price for the first half of 2014 is well below the average for the corresponding period in 2013 and only just above the average achieved for the same period in 2010. After what was considered by distributors to be an extraordinarily low box rate for the first quarter of the year (€14.21) there had been expectations that Aldi would compensate distributors by a higher rise – however the H1 average is the second lowest over the past seven years. Mr McCann has previously warned of the need for higher selling prices — how will Fyffes square the Aldi circle?

Conclusion

Unless the supply side of the economic equation can be brought under greater control there are few reasons to believe that more value can be created for all the stakeholders in the global banana supply chain. In this regard the ChiquitaFyffes deal is a game-changer. It should bring greater logic into the banana business not only because the market is more consolidated as a result of the merger but also because the entry barrier for those customers wishing to circumvent 'traditional' supply channels is suddenly that much higher ■

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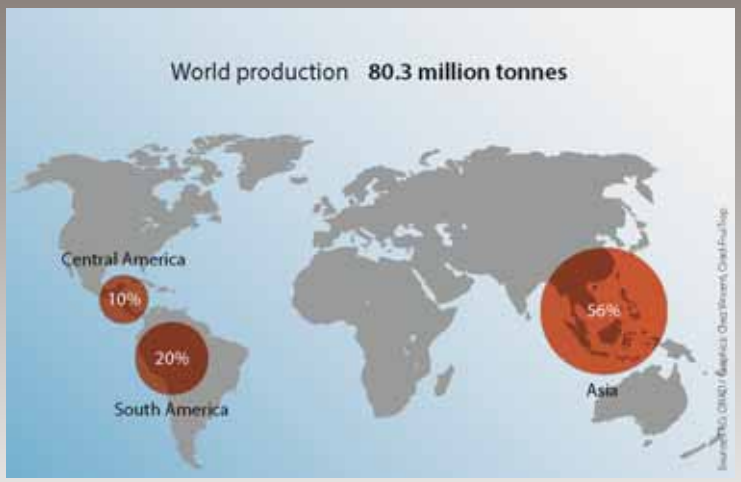
BANANA — Production (2012)



Banana — The 10 leading producer countries	
tonnes	**2012**
India	24 869 000
Philippines	9 226 000
Ecuador	7 012 000
Brazil	6 902 000
Indonesia	6 189 000
Angola	2 991 454
Guatemala	2 700 000
Tanzania	2 525 000
Mexico	2 204 000
China	1 055 000

excluding cooking bananas / Professional sources, FAO

BANANA — Imports (2012)

Banana — The 10 leading importing countries	
tonnes	**2012**
United States	4 353 136
Belgium	1 256 146
Russia	1 255 608
Japan	1 086 189
United Kingdom	955 669
China*	906 971
Iran*	615 879°
Germany	614 514
France**	538 461
Italy	516 528

* 2011 / ** Including island production marketed locally or shipped to the continent / Sources: national customs

USA — Imports — Main supplier countries							
000 tonnes	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Guatemala	1 093	1 189	1 112	1 152	1 333	1 459	1 608
Costa Rica	1 037	874	563	835	845	848	791
Ecuador	929	830	958	980	879	720	764
Honduras	483	506	389	436	445	536	603
Colombia	377	451	422	461	385	440	455
Mexico	32	66	105	146	149	223	257
Nicaragua	33	31	25	36	36	36	35
Peru	18	23	20	20	23	26	23
Dom. Rep.	2	0	1	0	1	3	6
Panama	1	8	5	29	28	59	4
Total	**4 004**	**3 978**	**3 599**	**4 094**	**4 123**	**4 353**	**4 548**

Source: COMTRADE

Canada — Imports — Main supplier countries							
000 tonnes	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Guatemala	75	81	93	90	147	161	156
Ecuador	100	121	164	147	110	106	127
Costa Rica	125	115	71	106	118	110	127
Colombia	138	122	129	115	93	95	91
Honduras	23	29	17	30	27	41	39
Mexico	2	3	2	1	2	7	10
Peru	1	1	1	2	2	2	3
United States	2	1	1	1	1	1	1
Total	**472**	**478**	**482**	**496**	**507**	**527**	**558**

Source: COMTRADE

BANANA — Exports (2012)

Banana — The 10 leading exporting countries	
tonnes	**2012**
Ecuador	5 020 000
Philippines	2 648 000
Costa Rica	2 103 000
Guatemala	1 913 000
Colombia*	1 695 000
Honduras*	586 000
Canaries	371 000
Dominican Republic	300 000
Panama**	263 514
Côte d'Ivoire***	224 943

* estimate / ** 2011 / *** EU volumes / Professional sources and national Customs

Latin America + Caribbean — Imports							
000 tonnes	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Argentina	296	319	347	344	351	395	377
Chile	169	169	175	179	176	185	191
El Salvador	105	119	113	96	112	*112*	113
Uruguay	45	42	43	42	44	45	44
Colombia	31	89	72	67	25	45	26
Honduras	20	16	0	63	56	24	25
Trinidad	3	4	4	5	15	*14*	*14*
Costa Rica	18	24	28	26	22	25	13
Guatemala	5	12	7	5	2	5	8
Nicaragua	0	3	3	6	8	7	7
Total	**691**	**798**	**792**	**835**	**813**	**859**	**821**

Source: COMTRADE

EU-27 — Imports — Main supplier countries							
000 tonnes	2007	2008	2009	2010	2011	2012	2013
Total EU prod., incl.	**555**	**568**	**608**	**660**	**612**	**648**	**615**
Canaries	361	371	352	397	346	371	361
Martinique	129	125	180	199	181	185	159
Guadeloupe	38	47	56	43	62	67	72
Madeira	17	18	14	14	15	18	16
Cyprus	6	4	3	5	6	6	5
Greece	3	3	3	2	2	2	2
Total dollar, incl.	**3 848**	**3 968**	**3 588**	**3 492**	**3 628**	**3 512**	**3 684**
Ecuador	1 186	1 349	1 278	1 223	1 340	1 307	1 289
Colombia	1 156	1 281	1 206	1 168	1 137	1 134	1 159
Costa Rica	971	902	753	777	845	770	817
Panama	354	295	183	184	160	144	194
Peru	34	39	44	51	66	81	104*
Mexico	0	2	22	13	10	20	54
Brazil	86	58	56	64	52	41	43
Guatemala	19	14	4	3	3	5	12
Honduras	32	24	9	15	17	6	5
Venezuela	10	0	0	0	0	0	0
Total ACP, incl.	**889**	**843**	**919**	**958**	**1 024**	**977**	**982**
Dominican Rep.	206	171	228	304	327	295	323
Côte d'Ivoire	189	217	229	244	224	225	252
Cameroon	222	280	250	243	234	214	249
Belize	62	82	80	79	71	99	97
Surinam	59	66	58	70	63	83	81
Ghana	34	46	36	52	47	51	43
St Lucia	30	39	33	23	6	12	12
Dominica	7	10	36	4	4	2	1
St Vincent	14	9	8	4	1	1	0
Jamaica	18	0	0	0	0	0	0
Total	**843**	**919**	**958**	**1 024**	**979**	**982**	**1 059**

*2013 estimated total, to be corrected by EUROSTAT / Source: EUROSTAT

Other Western European countries — Imports							
000 tonnes	2007	2008	2009	2010	2011	2012	2013
Switzerland	78	82	81	80	79	79	82
Norway	78	84	81	78	78	77	81
Iceland	6	6	6	6	6	6	6
Total	**162**	**171**	**168**	**164**	**163**	**161**	**169**

Source: COMTRADE

Russia — Imports — Main supplier countries							
000 tonnes	2007	2008	2009	2010	2011	2012	2013
Ecuador	920	903	911	977	1 200	1 122	1 279
Costa Rica	2	66	33	48	39	80	24
Philippines	25	32	25	30	35	38	17
Colombia	22	0	5	10	18	14	14
Mexico	0	0	3	1	0	0	3
Panama	0	0	0	0	12	0	1
China	6	5	4	3	2	1	1
Vietnam	0	0	0	0	1	0	1
Brazil	0	0	0	0	0	1	0
Total	**979**	**1 007**	**981**	**1 069**	**1 308**	**1 256**	**1 339**

Source: COMTRADE

Ukraine — Imports — Main supplier countries							
000 tonnes	2006	2007	2008	2009	2010	2011	2012
Ecuador	220	289	270	202	200	221	203
Costa Rica	22	2	5	8	12	13	24
Panama	2	0	0	3	0	5	8
Colombia	5	1	2	9	3	8	5
Guatemala	13	6	0	5	0	0	3
Mexico	7	0	0	0	0	0	0
Honduras	2	0	0	0	0	0	0
Total	**272**	**298**	**278**	**227**	**215**	**248**	**243**

Source: COMTRADE

Other Central and Eastern European countries — Imports							
000 tonnes	2007	2008	2009	2010	2011	2012	2013
Belarus	33	42	37	44	40	59	74
Croatia	55	57	52	49	43	46	54
Serbia	66	69	43	42	52	45	47
Bosnia	38	41	37	37	38	33	37
Macedonia	16	15	17	17	19	17	25
Albania	20	17	17	18	17	18	17
Moldavia	11	13	12	11	12	11	*12*
Montenegro	9	8	8	7	7	8	8
Total	**248**	**263**	**223**	**224**	**230**	**238**	**275**

Source: COMTRADE

Japan — Imports — Main supplier countries							
000 tonnes	2007	2008	2009	2010	2011	2012	2013
Philippines	879	1 019	1 159	1 035	1 004	1 027	909
Ecuador	52	46	62	46	34	36	41
Taiwan	19	9	9	10	8	8	7
Peru	8	7	11	8	9	7	6
Guatemala	0	0	0	0	0	1	4
Mexico	5	5	5	4	3	3	3
Colombia	3	2	4	3	2	2	3
Thailand	2	2	2	2	2	2	1
China	2	1	1	1	1	1	1
Total	**971**	**1 093**	**1 253**	**1 109**	**1 064**	**1 086**	**975**

Source: national Customs

Far East — Imports							
000 tonnes	2006	2007	2008	2009	2010	2011	2012
China	463	402	437	575	741	907	707
South Korea	280	308	258	257	338	353	*320*
Singapore	36	37	38	40	39	42	45
Nepal	0	0	0	2	7	17	*17*
Thailand	13	7	20	9	12	11	15
Malaysia	0	0	1	1	2	2	8
Indonesia	0	0	0	0	3	2	2
Total	**780**	**747**	**734**	**874**	**1 125**	**1 318**	**1 089**

Source: COMTRADE

Minor Asia — Imports							
000 tonnes	2006	2007	2008	2009	2010	2011	2012
Kazakhstan	25	34	38	47	45	45	43
Afghanistan	0	0	0	38	21	28	*28*
Azerbaijan	10	14	15	18	19	23	16
Armenia	9	17	8	8	8	11	13
Georgia	10	11	10	11	15	13	12
Kyrgyzstan	2	3	5	7	9	12	11
Total	**55**	**80**	**77**	**129**	**118**	**131**	**122**

Source: COMTRADE

Middle East — Imports							
000 tonnes	2006	2007	2008	2009	2010	2011	2012
Iran	*294*	*429*	*403*	*500*	661	616	*630*
Saudi Arabia	235	248	257	252	307	306	335
Un. Arab Emirates	0	123	127	126	124	126	*130*
Kuwait	68	89	96	*100*	*100*	*100*	100
Qatar	15	18	22	*25*	28	*30*	27
Bahrain	10	10	*12*	14	14	16	*16*
Oman	6	9	11	10	10	14	*14*
Total	**627**	**926**	**927**	**1 028**	**1 244**	**1 208**	**1 251**

Source: COMTRADE

Africa — Imports							
000 tonnes	2006	2007	2008	2009	2010	2011	2012
South Africa	13	22	24	23	37	52	62
Mali	31	11	21	21	19	17	17
Senegal	16	17	17	17	17	14	16
Niger	2	1	1	1	4	4	5
Botswana	6	6	7	8	9	7	5
Namibia	2	2	3	3	3	5	4
Mauritania	3	3	3	3	2	3	3
Burkina Faso	0	0	0	3	3	3	*3*
Rwanda	8	6	3	4	4	2	1
Nigeria	0	0	0	4	7	1	0
Zimbabwe	0	0	0	0	4	0	0
Total	**72**	**67**	**79**	**82**	**107**	**108**	**116**

Source: COMTRADE

Mediterranean — Imports							
000 tonnes	2006	2007	2008	2009	2010	2011	2012
Syria	323	193	219	219	232	*240*	*24*
Algeria	147	163	164	180	208	245	231
Turkey	184	224	219	182	201	235	225
Jordan	9	20	33	26	40	48	50
Tunisia	20	41	34	37	19	41	*30*
Egypt	6	5	3	2	10	26	28
Morocco	5	17	19	27	28	25	28
Palestine	0	6	0	1	14	10	14
Total	**695**	**669**	**691**	**674**	**752**	**870**	**846**

Source: COMTRADE

Oceania — Imports							
000 tonnes	2007	2008	2009	2010	2011	2012	2013
New Zealand	87	88	84	81	87	87	88

Source: COMTRADE

Banana
diseases and pests

by Luc de Lapeyre and Eric Fouré

Panama disease

Gros Michel

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.

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 and that 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 importance 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

Panama disease on Petite Naine

Black Sigatoka

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

As for numerous soil pathogens, control methods are limited and consist essentially of keeping areas containing the outbreaks in quarantine. Not much international work is being performed on this disease, whose study 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.

Sigatoka leaf streak diseases

Banana production is confronted with two main types of leaf streak disease: Yellow Sigatoka and Black Sigatoka. They are caused by parasitic leaf fungi. The pathogen of Yellow Sigatoka is *Mycosphaerella musicola* and that of Black Sigatoka is *Mycosphaerella fijiensis*.

A new fungal species, *Mycosphaerella eumusa*, that may be responsible for a new, even more aggressive form of Black Sigatoka, seems to be spreading in Asia and the Indian Ocean, but this remains to be confirmed (it has also been detected in Nigeria in West Africa).

Propagation is from banana plant to banana plant in continental zones. Maritime zones form a natural obstacle. Although the risk of natural spread of spores by wind does exist, the spread of the disease from one zone to another is usually the result of uncontrolled transfers of germplasm. Black Sigatoka is present in all the producer countries in Latin America, Africa and Asia. The countries of the Caribbean arc were long protected by their island status. The presence of the diseases in St Vincent and Guiana was confirmed in 2009. It was reported officially in St Lucia in early 2010, in Martinique in September 2010 and in Guadeloupe in early 2012.

Although Black Sigatoka has not yet been detected in Dominica it is certain to reach the island, probably fairly soon.

The fungus that causes the disease destroys the foliage. The disease takes the form of small elongated black streaks that soon become necrotic. Necrosis spreads and may destroy all the

Distribution of Black Sigatoka in the Caribbean arc

Yellow Sigatoka

leaves of the plant before the bunch is cut. This results in smaller yields and very ripe fruits that are unsalable.

The sequence is precisely the same as that caused by Yellow Sigatoka, a fungal disease present on all the continents for about 60 years. With support from CIRAD, rational chemical control of the disease was established by professionals in Martinique and Guadeloupe. Warning methods (biological and meteorological) based on the weekly observation of biological and meteorological descriptors in plantations make it possible to monitor the dynamics of the disease and to apply appropriate treatments. Yellow Sigatoka has been controlled in recent years with a small number of sprayings: an average of five to seven a year in West Indian plantations. These rational control methods can now be applied in the management of Black Sigatoka.

There are fundamental differences between the two leaf streak diseases. Unlike Yellow Sigatoka, Black Sigatoka can develop on export bananas and also on plantains and other cultivated varieties that are also very susceptible to the disease. It spreads rapidly and is very difficult to control. Depending on the country, the strategies used and production conditions (climate, crop management sequences, etc.), management requires from just a few interventions to more than 50 sprayings per year.

Black Sigatoka

Black Sigatoka

Different control strategies

In the main Latin American producer countries, export banana plantations form vast agroindustrial units in alluvial plains. Given the areas of the estates (several hundred or even several thousand hectares), there is little outside contamination. There are no outbreaks of the disease in the immediate neighbourhood of agroindustrial plantations. Agroclimatic homogeneity makes it possible to organise and rationalise the spraying of large units. Low labour costs facilitate the cleansing work required in the form of regular deleafing. In this context, the impact of spraying in terms of nuisance is not always taken into account by the large companies, who do not hesitate to use systematic control strategies leading to more than 50 sprayings per year. In this case, sprayings are often performed at less than weekly intervals, and generally involve contact fungicides (chlorothalonil, dithiocarbamates, etc.) that by definition are not very effective, and so have a small curative effect. Systemic fungicides are sometimes used but usually in 'cocktails' that are mixes of systemic, penetrating and contact substances prepared as emulsions in oil.

CIRAD has developed rational control strategies that, for the control of Yellow and Black Sigatoka, are based on warning systems involving either scouting in the plantation or the observation of meteorological descriptors (precipitation, evaporation, temperature, etc.). This strategy has been applied in different countries to control Yellow Sigatoka and also Black Sigatoka. This is the case in particular in Guadeloupe, Martinique, Cameroon and Côte d'Ivoire. The main objectives are as follows:

- improving the effectiveness of control while reducing the number of sprayings per year;
- limiting the risks of the selection of fungal strains that are resistant to the systemic fungicides used;
- reducing pollution and thus achieving greater respect for human health and the environment (urban centres, rivers, water bodies, reservoirs, etc.).

The strategy is also based on the rational, alternate use of systemic fungicides (benzimidazoles, triazoles, strobilurins) and penetrating fungicides (morpholines, etc.) which are mixed with refinery oils that are also fungistatic and applied at low volume (13 to 15 litres per hectare), prolonging the effectiveness of each spraying and hence reducing the number of sprayings required each year.

The systemic fungicides on the market have a single-site mode of action on the pathogen and the risk of the appearance of resistant strains is high if they are used irrationally or abusively. In Central America, benzimidazoles were used massively when they came on to the market and resistance was observed only two years after they began to be used to control Black Sigatoka. This made it necessary to use more contact fungicides (15 to 40 kg active substance per hectare per year). The same phenomenon was then observed in these production zones with Black Sigatoka when triazoles and then strobilurins were used.

Thanks to the warning methods and hence the reduced number of sprayings, the phenomenon did not appear in Cameroon and Côte d'Ivoire for 10 or even 15 years of use of the fungicides to control Black Sigatoka.

In Guadeloupe and Martinique, the problems started to appear with control of Yellow Sigatoka after 20 or even 30 years of rational use of these fungicides using warning methods.

New essential control methods

Present control strategies cannot be used indefinitely. The European legislation in force in the French

Moko disease

West Indies makes it technically impossible to use rational control strategies based on the alternation of several active substances with different modes of action. Only two fungicides in the triazole family can currently be used for aerial spraying.

A strobilurin fungicide and another in the morpholin group received marketing authorisations at the end of 2008, but they are not used to control Sigatoka diseases as the authorisation is accompanied by a 100-metre unsprayed buffer zone and this is incompatible with aerial spraying.

Actions can be envisaged to address this problem of regulations, such as reducing the buffer zone to 50 metres, using land-based sprayers and technical developments to reduce the drift of fungicide sprays, the registration of new systemic fungicides, requests for derogations, etc. — but the legislation may well become increasingly restrictive in the future.

The feasibility of the implementation of rational control is based on the status of the fungal strains with regard to curative fungicides. If the strains are (see status of invasive strains) or become resistant to these fungicides (see risks of the rapid mutation of *M. fijiensis*), this will irremediably compromise the implementation of such strategies.

Other methods must therefore be sought to control or regulate Black Sigatoka. Breeding new hybrid varieties with lasting resistance and good agricultural and organoleptic potential is a component of integrated management to be favoured for the control of Black Sigatoka.

These varieties must be incorporated in innovative, sustainable cropping systems that also include cultural control methods (optimum plant management, rational management of inoculum using mechanical cleansing techniques, etc.) that will thus make it possible to reduce the negative environmental impacts of commercial plantations and in particular reduce the application of pesticides.

Think of adopting an overall approach combining new hybrids resistant to Black Sigatoka and cropping systems that enable sustainable conservation of resistance.

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 solanecearum*

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

Xanthomonas Wilt

Bunchy top

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. Control is 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 is 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. 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%. Spread is 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*.

Banana streak disease

Banana borer on a corm

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 infections 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*).

Prevention and control

The only control method available today to fight these banana virus diseases is control of the vector and the use of healthy plant material. 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 material. The adults do no damage. The females lay eggs in the banana rhizome and the larvae feed on this, driving 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 material (tissue culture plants) used in clean soil

Nematode

(after fallows) 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 at the farm 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 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).

Ripe-fruit anthracnose

Wound anthracnose

Crown rot

These methods are widely used by growers in Martinique and Guadeloupe, where they have contributed to a 50-percent reduction in pesticide spraying in the past ten years.

Operations involving biological antagonists, root symbionts (mycorrhizal fungi) and especially genetic resistance may allow the setting up of increasingly effective integrated control strategies in the fairly near future. However, it is necessary to be aware that the great complexity of nematode populations makes the development of these more closely targeted techniques a delicate task. To be effective, they must be able to handle the diversity of cultural 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 give 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 the fungicide preparations discharge near packing stations.

Banana quality defects in the field

Pests

Flower thrips

Red rust thrips

Snail damage

Damage by *Diaprepes* root weevil

Silver rust thrips

Banana quality defects in the field

Physiological defects and other imperfections

Double fruit and deformed fruit

Scarring by a fruit tip

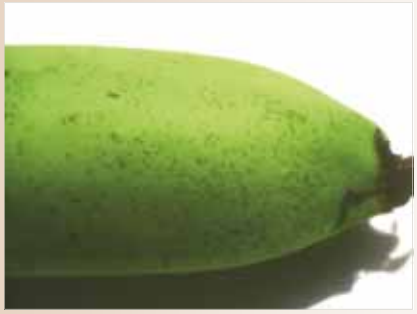
Scarring by a leaf

Scarring by guying cord

Sunscald

Chemical burns

Diseases



Speckling

Red speckling at ripening

Deightoniella

Sooty mould on fruit stalk

Cigar-end rot

Banana quality defects at packing

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

Selection problems and miscellaneous defects

Fruit too thin

Fruit too short

Incomplete flower removal

Latex stains

Bruising

Flexed fruit stalks

Bruising caused by impact during packing

Dehanding problems

Crown cut too short

Pointed crown

Detached crown

Knife wound

Banana quality defects after transport

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

Ripening problems

'Ship ripe' fruits

Unevenness after ripening

Storage problems

Chilling injury

'Green ripe' fruits

Storage diseases

Latent anthracnose infection

Wound anthracnose

Crown rot

Crown rot

Genetic diversity of the banana

Over a period of thousands of years, population migrations and movement of plant material have placed the banana in very different ecological contexts in the various continents. Farmers have succeeded in profiting from 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 foodstuff (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 (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 bananas (more than 50) and Central and West African plantain (more than 150) 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 ■

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Banana — Estimated world production in 2013

Tonnes	Cooking bananas		Dessert bananas		Total
	Plantain AAB group	Highland Bananas + ABB group + others	Cavendish	Gros Michel + others	
North America	0	1 000	8 000	100	9 100
South America	5 664 779	416 491	12 479 463	3 927 750	22 488 483
Central America	783 830	63 835	7 551 531	81 500	8 480 696
Caribbean	1 061 898	669 130	1 125 518	199 930	3 056 476
West and Central Africa	8 981 861	758 796	2 349 174	485 342	12 575 173
East Africa	944 716	14 984 031	2 726 439	874 516	19 529 702
North Africa and Middle East	31	9 267	2 096 987	71 871	2 178 156
Asia	2 130 784	10 726 670	32 035 734	12 942 422	57 835 610
Oceania	1 276	530 003	673 961	259 506	1 464 746
Europe	2	20	422 641	30	422 693
World total	19 569 177	28 159 243	61 469 448	18 842 967	128 040 835

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

Estimates in tonnes Production and commerce 2012 data + EU import export and USA 2013 (or 2011 data in italics)	Production					Exports		Imports	
	Cooking bananas		Dessert bananas						
	Plantains AAB	Highland bananas + ABB + other AAB + AAA + AA	Cavendish AAA	Gros Michel & other AA, AAA, AAB, ABB	Total	Cavendish	Plantain	Dessert banana	Plantain
North America									
Canada					**0**	*48*	*17*	557 593	*3 000*
United States		1 000	8 000	100	**9 100**	*516 119*		4 547 932	*269 930*
Greenland					**0**			250	
Saint Pierre & Miquelon								*65*	
Total	**0**	**1 000**	**8 000**	**100**	**9 100**	**516 167**	**17**	**5 105 840**	**272 930**
	0.0 %	11.0 %	87.9 %	1.1 %	**100.0 %**	10.1 %	0.0 %		
Central America									
Belize	12 000	200	101 000	1 000	**114 200**	96 733	*100*	*20*	
Costa Rica	80 000	2 000	2 200 000	10 000	**2 292 000**	2 103 000	*5 427*	12 676	*3 696*
Guatemala	195 000	21 000	2 200 000	10 000	**2 426 000**	1 913 000	*102 296*	12 055	*100*
Honduras	86 000	11 000	700 000	20 000	**817 000**	*489 039*	*1 892*	24 948	*12 247*
Mexico	230 330	10 000	1 933 531	30 000	**2 203 861**	*179 838*	299	*115*	*19*
Nicaragua	66 000	12 000	42 000	3 000	**123 000**	*8 250*	*39 690*	7 440	*199*
Panama	78 500	6 800	335 000	6 000	**426 300**	263 514	3 396	*3*	*17*
El Salvador	36 000	835	40 000	1 500	**78 335**	*2*		120 787	*62 242*
Total	**783 830**	**63 835**	**7 551 531**	**81 500**	**8 480 696**	**5 053 376**	**153 100**	**178 044**	**78 520**
	9.2 %	0.8 %	89.0 %	1.0 %	**100.0 %**	66.9 %	19.5 %		
South America									
Argentina			174 950	50	**175 000**	277		376 569	*159*
Bolivia	120 000	11 000	134 000	60 000	**325 000**	*108 095*	*50*		
Brazil	453 350	30 000	3 946 611	2 900 000	**7 329 961**	92 973	25	*7*	
Chile					**0**	*200*		189 282	*3 578*
Colombia	2 657 910	180 000	1 982 702	489 000	**5 309 612**	1 695 000	*86 974*	21 095	*40 621*
Ecuador	559 319	47 291	5 420 000	155 000	**6 181 610**	5 020 000	*162 051*	*19*	
Guiana	5 000	800	6 600	1 000	**13 400**	*50*	*301*		*22*
French Guiana	1 200	800	1 700	1 300	**5 000**			2 200	
Falkland Isl.								*20*	
Paraguay		300	65 000	4 300	**69 600**	*32 574*		*915*	
Peru	1 355 000	125 000	320 000	200 000	**2 000 000**	*108 785*	*108 167*	*41*	
Surinam	13 000	1 300	90 000	5 000	**109 300**	82 000	10		
Uruguay					**0**	*1*		45 743	
Venezuela	500 000	20 000	337 900	112 100	**970 000**	*8*	*757*		*21 000*
Total	**5 664 779**	**416 491**	**12 479 463**	**3 927 750**	**22 488 483**	**7 139 963**	**358 335**	**635 891**	**65 380**
	25.2 %	1.9 %	55.5 %	17.5 %	**100.0 %**	57.2 %	6.3 %		
Caribbean									
Anguilla			1					70	12
Antigua & Barbuda	2	4	239	5	**250**			*88*	*53*
Netherlands Antilles			10		**10**	*10*		*2 419*	*558*
Aruba					**0**			2 959	*580*
Bahamas	178	20	4 240	35	**4 473**	*17*		*1 360*	*1 000*
Barbados	47	40	848	15	**950**	*1*		*2 376*	*1 198*
Bermuda	400	30	320	5	**755**	*1*		*886*	
Cuba	230 000	459 504	25 496	170 000	**885 000**	*30*		*275*	
Dominica	3 600	600	3 400	300	**7 900**	1 900	*573*		
Grenada	300	150	1 000	36	**1 486**	*59*	*1*	*22*	
Guadeloupe	8 000	550	77 900	1 000	**87 450**	71 511			200
Haiti	267 000	60 000	120 000	18 000	**465 000**	*2*	300	7 515	3 803
Cayman Isl.	23	1	214	9	**247**			*408*	
Turks & Caicos Isl.								*487*	136
Virgin Isl. (USA)	250	50	1 300	100	**1 700**				1
Virgin Isl. (UK)	80	10	350	20	**460**	*73*		*40*	27
Jamaica	36 203	1 000	31 000	4 000	**72 203**	*1*	*1*	*19*	*3*
Martinique	14 000	400	170 000	800	**185 200**	159 015			3
Montserrat	75	10	100	5	**190**			*10*	10
Puerto Rico	92 000	2 000	70 000	500	**164 500**			*1 738*	*800*
Dominican Republic	400 000	143 461	600 000	4 200	**1 147 661**	329 000	*3 804*		
Saint Kitts & Nevis					**0**			500	*500*
St Vincent & Grenadines	2 790	500	2 000	300	**5 590**	215	1 150	*20*	*1*
St Lucia	1 700	300	13 500	500	**16 000**	13 000	*200*	*10 000*	*1*
Trinidad & Tobago	5 250	500	3 600	100	**9 450**	*45*		*12 032*	*2 506*
Total	**1 061 898**	**669 130**	**1 125 518**	**199 930**	**3 056 476**	**574 880**	**6 029**	**43 154**	**11 391**
	34.7 %	21.9 %	36.8 %	6.5 %	**100.0 %**	51.1 %	0.6 %		

Estimates in tonnes Production and commerce 2012 data + EU import export and USA 2013 (or 2011 data in italics)	Production					Exports		Imports	
	Cooking bananas		Dessert bananas						
	Plantains AAB	Highland bananas + ABB + other AAB + AAA + AA	Cavendish AAA	Gros Michel & other AA, AAA, AAB, ABB	Total	Cavendish	Plantain	Dessert banana	Plantain
East Africa									
South Africa	20	1 500	381 560	3 600	**386 680**	*433*		96 341	
Botswana					**0**	*5*		*6 447*	
Burundi	115 000	844 000	130 000	95 075	**1 184 075**	*23*			*10*
Comoros	3 000	13 000	35 000	15 000	**66 000**			*10*	
Djibouti			1		**1**			*3 590*	
Eritrea			10	1	**11**	*20*		*15 000*	
Ethiopia	100	1 000	298 902	2 500	**302 502**	*4 075*		*1*	
Réunion Isl.	10	500	7 500	4 790	**12 800**				
Kenya	30 000	872 412	412 000	80 000	**1 394 412**	*23*		*557*	*10*
Lesotho					**0**			*2 900*	
Madagascar	15 000	12 000	314 000	15 000	**356 000**	*35*			
Malawi	75 000	20 000	50 000	10 000	**155 000**				
Mauritius	10	700	8 686	800	**10 196**			*1*	
Mayotte	640	6 400	6 000	1 000	**14 040**				
Mozambique	50 000	5 300	411 700	3 000	**470 000**	*49 309*			
Uganda	180 000	8 520 000	50 000	450 000	**9 200 000**	761	*1 505*	*1 944*	*1 000*
Rwanda	320 000	2 679 465	180 000	40 000	**3 219 465**	20	*1*	*1 916*	*10*
Seychelles	80	300	1 520	100	**2 000**			*1*	
Somalia	5 000	1 000	32 000	1 000	**39 000**	*18*	*1*		
Sudan		1 000	83 000	2 000	**86 000**	*4 828*			
Swaziland	5	4	5 990	1	**6 000**	*7 500*		*5 000*	
Tanzania	150 700	2 004 900	219 140	150 000	**2 524 740**	*426*	*1*	*1*	
Zambia	1	50	680	49	**780**	*16*		*895*	
Zimbabwe	150	500	98 750	600	**100 000**	*1 922*		17	
Total	**944 716**	**14 984 031**	**2 726 439**	**874 516**	**19 529 702**	**69 414**	**1 508**	**134 621**	**1 030**
	4.8 %	76.7 %	14.0 %	4.5 %	**100.0 %**	2.5 %	0.2 %		
West and Central Africa									
Angola	120 000	10 000	287 000	15 700	**432 700**			*20*	100
Benin	45 000	500	18 500	3 000	**67 000**		200	*291*	2 100
Burkina Faso	100	10	15 000	10	**15 120**	*210*		3 000	*1 636*
Cameroon	1 600 000	200 000	500 000	220 000	**2 520 000**	254 000	40 000	*36*	
Cape Verde	10	30	7 330	30	**7 400**			*3*	
Congo	84 000	3 000	28 000	3 000	**118 000**			*11*	2 000
Congo (Dem. Rep.)	400 000	110 000	222 000	100 000	**832 000**	*208*	3 000	*5*	
Côte d'Ivoire	1 577 043	205 454	450 000	6 000	**2 238 497**	310 000	35 000		
Gabon	80 000	10 000	15 000	2 000	**107 000**			*2*	11 000
Gambia	8	1	180	1	**190**			2 800	
Ghana	1 980 000	50 000	120 000	10 000	**2 160 000**	46 000	*444*	*21*	200
Guinea	450 000	20 000	190 000	20 000	**680 000**	*19*	20		
Guinea Bissau	36 000	4 000	7 500	400	**47 900**	*1*			
Equatorial Guinea	40 000	3 000	8 500	1 000	**52 500**	*57*			9 000
Liberia	47 000	5 000	30 000	10 000	**92 000**			*3 929*	*14*
Mali	6 500	500	110 000	500	**117 500**			16 934	5 500
Mauritania		1	70	1	**72**	*2*		3 067	
Namibia					**0**	*8*		4 279	
Niger			350		**350**			4 811	2 500
Nigeria	2 358 000	127 000	230 000	85 000	**2 800 000**		*1*	336	1 000
Central African Rep.	85 000	6 000	41 634	5 900	**138 534**				2 000
St Helena								50	
Sao Tomé & Principe	3 000	1 000	1 500	1 000	**6 500**				*10*
Senegal	200	100	34 600	100	**35 000**	*22*		15 569	*22*
Sierra Leone	42 000	2 000	9 000	1 000	**54 000**			*10*	
Chad			10		**10**			15 000	1 500
Togo	28 000	1 200	23 000	700	**52 900**	*15*		2	100
Total	**8 981 861**	**758 796**	**2 349 174**	**485 342**	**12 575 173**	**610 542**	**78 665**	**70 176**	**38 682**
	71.4 %	6.0 %	18.7 %	3.9 %	**100.0 %**	26.0 %	0.9 %		
North Africa & Middle East									
Algeria		1	324	10	**335**			274 050	
Saudi Arabia			1		**1**	*8 548*		334 831	
Bahrain			950	50	**1 000**	*613*		*15 651*	
West Bank		5	4 000	5	**4 010**			13 509	
Egypt	1	3 000	1 061 486	65 290	**1 129 777**	*9 926*		28 391	
United Arab Emirates			200		**200**	*7 322*		*126 167*	
Iraq			10		**10**			*516*	
Iran		3 000	124 000	3 000	**130 000**	*6 040*		*615 879*	
Israel		1 000	127 412	1 110	**129 522**	15		*11*	
Jordan		400	37 912	540	**38 852**	*441*		49 788	
Kuwait					**0**	*42*		100 000	
Lebanon	10	600	123 800	590	**125 000**	*42 858*		*185*	
Libya		1	2	1	**4**			*4 999*	
sub-total (contd. p. 101)	**11**	**8 007**	**1 480 097**	**70 596**	**1 558 711**	**75 805**	**0**	**1 563 977**	

Estimates in tonnes Production and commerce 2012 data + EU import export and USA 2013 (or 2011 data in italics)	Production					Exports		Imports	
	Cooking bananas		Dessert bananas						
	Plantains AAB	Highland bananas + ABB + other AAB + AAA + AA	Cavendish AAA	Gros Michel & other AA, AAA, AAB, ABB	Total	Cavendish	Plantain	Dessert banana	Plantain
North Africa & Middle East (concluding)									
Morocco		500	221 267	500	**222 267**	47		28 139	
Oman		500	62 200	300	**63 000**	*3 762*		*13 740*	
Qatar					**0**	*460*		26 592	
Western Sahara					**0**			*2 500*	
Syria			239	10	**249**			240 000	
Tunisia		10	55	50	**115**	*4 635*		*41 338*	
Turkey		50	206 181	115	**206 346**	*1 500*		235 188	
Yemen	20	200	126 948	300	**127 468**	*91 032*		*22*	
Total	**31**	**9 267**	**2 096 987**	**71 871**	**2 178 156**	**177 241**	**0**	**2 151 496**	**0**
	0.0 %	0.4 %	96.3 %	3.3 %	**100.0 %**	8.5 %	0.0 %		
Asia									
Afghanistan					**0**			*27 692*	
Azerbaijan					**0**			15 757	*18*
Bangladesh	13 000	120 000	396 407	216 520	**745 927**	*260*	20	*150*	
Bhutan	74	500	1 526	400	**2 500**			*432*	
Brunei		40	740	70	**850**			*253*	
Cambodia	10 000	45 000	80 000	25 000	**160 000**				
China	100	568 000	9 381 900	600 000	**10 550 000**	*10 241*		707 431	
South Korea					**0**	*593*		313 604	
North Korea					**0**			*20*	
Hong Kong					**0**	*25 734*		*88 296*	
India	1 910 000	2 557 900	11 901 590	8 500 000	**24 869 490**	*40 921*	1	*1*	
Indonesia	70 000	2 356 352	2 541 348	1 221 352	**6 189 052**	*1 735*	1	1 922	
Japan			200		**200**	*9*		1 086 189	*6 380*
Kazakhstan					**0**	*96*		43 110	*15*
Kyrgyzstan					**0**	*115*		10 859	
Laos	1 000	153 000	146 100	65 000	**365 100**			*4 429*	
Macau					**0**			*2 538*	
Malaysia	20 000	60 000	165 974	90 000	**335 974**	*22 864*		8 495	
Maldives	90	3 060	3 500	850	**7 500**			*991*	*29*
Mongolia					**0**			*2 933*	
Myanmar	20 000	560 000	190 000	230 000	**1 000 000**				
Nepal	10	20 000	135 834	12 640	**168 484**	*3*		17 000	
Uzbekistan					**0**			*700*	
Pakistan	500	9 000	120 500	5 000	**135 000**	*58 786*		*2*	
Philippines	1 000	2 854 658	5 000 000	1 370 340	**9 225 998**	2 648 000		*1*	
Singapore					**0**	*166*		44 592	
Sri Lanka	63 000	293 420	162 000	55 000	**573 420**	*230*	*10 186*	*3*	*55*
Tajikistan								*120*	
Taiwan		100	294 965	200	**295 265**	*10 284*		*16*	
Thailand	20 000	530 000	800 000	300 000	**1 650 000**	*74 560*	*100*	14 667	
East Timor	10	40	750	50	**850**			*20*	
Turkmenistan								*100*	
Vietnam	2 000	595 600	712 400	250 000	**1 560 000**	*39 545*	*11*		
Total	**2 130 784**	**10 726 670**	**32 035 734**	**12 942 422**	**57 835 610**	**2 934 142**	**10 319**	**2 392 324**	**6 497**
	3.7 %	18.5 %	55.4 %	22.4 %	**100.0 %**	9.2 %	0.5 %		
Oceania									
Australia	50	600	261 885	23 000	**285 535**	*1*		*122*	
Fiji	100	1 550	3 150	100	**4 900**	*15*		*2*	
Guam		100	350		**450**			*1 000*	
Cook Isl.		20	95		**115**	*22*			
Marshall Isl.								*50*	
Solomon Isl.		90	255		**345**				
Kiribati		3 500	3 100	400	**7 000**				
Micronesia	280	300	1 413	13	**2 006**				
Niue		10	68	2	**80**	*50*			
New Caledonia	45	400	750	100	**1 295**			*2*	
New Zealand					**0**	*18*		87 780	*130*
Palau								*50*	
Papua New Guinea	500	500 000	385 000	232 500	**1 118 000**	*1 000*			
French Polynesia		900	1 900	600	**3 400**			*1*	
Samoa	100	13 634	5 766	500	**20 000**	*1*			
Samoa (USA)		250	540	70	**860**			*1*	
Tokelau		5	9	1	**15**				
Tonga	100	2 550	825	100	**3 575**				
Tuvalu	1	94	155	20	**270**				
Vanuatu	100	5 000	8 400	2 000	**15 500**	*4*			
Wallis & Futuna		1 000	300	100	**1 400**				
Total	**1 276**	**530 003**	**673 961**	**259 506**	**1 464 746**	**1 111**	**0**	**89 008**	**130**
	0.1 %	36.2 %	46.0 %	17.7 %	**100.0 %**	0.2 %	0.0 %		

Estimates in tonnes Production and commerce 2012 data + EU import export and USA 2013 (or 2011 data in italics)	Production					Exports		Imports	
	Cooking bananas		Dessert bananas		Total				
	Plantains AAB	Highland bananas + ABB + other AAB + AAA + AA	Cavendish AAA	Gros Michel & other AA, AAA, AAB, ABB		Cavendish	Plantain	Dessert banana	Plantain
Europe									
Azores			1 000		**1 000**				
Albania					**0**	*255*		17 079	
Germany					**0**	303 599	123	1 341 946	2 730
Andorra					**0**			*600*	
Armenia					**0**	*50*		12 503	
Austria					**0**	21 664	18	120 443	858
Belarus					**0**			74 374	*156*
Belgium - Luxembourg					**0**	1 228 048	35 522	1 275 302	52 403
Bosnia Herzegovina					**0**	*2*		36 794	*96*
Bulgaria					**0**	5 317	356	35 984	2 806
Canaries	1	5	389 989	5	**390 000**	360 981			
Cyprus			5 082	5	**5 087**	37		4 185	21
Croatia					**0**	*30*		53 703	2
Denmark					**0**	6 536	76	89 815	3 535
Spain			250	5	**255**	72 792	16 650	554 385	46 075
Estonia					**0**	126		9 999	*5*
Finland					**0**	189		77 662	44
France					**0**	282 620	407	842 337	39 699
Georgia					**0**	*365*		15 230	
Gibraltar								*150*	
Greece		5	3 000	5	**3 010**	30 913	1 957	130 956	10 633
Hungary					**0**	9 307	9 652	43 123	13 652
Faroe Isl.					**0**			*92*	
Ireland					**0**	4 426	5 239	68 807	16 691
Iceland			1		**1**	*5*		6 159	
Italy			340		**340**	55 999	7 294	655 000	19 899
Latvia					**0**	9 870	4	21 955	1 306
Lithuania					**0**	6 798	1 088	30 014	4 166
Macedonia					**0**	*8*	*119*	24 831	*19 087*
Madeira	1	10	20 979	10	**21 000**	15 775			
Malta					**0**	0		3 080	343
Moldavia					**0**			12 000	*131*
Montenegro						*8*		8 487	
Norway					**0**			81 266	*21*
Netherlands					**0**	13 074	5 502	265 395	23 977
Poland					**0**	9 372	1 551	215 699	16 957
Portugal			2 000		**2 000**	4 105		152 005	4 408
Czech Rep.					**0**	35 493	21	124 140	7 477
Romania					**0**	952	*1 269*	42 705	*16 250*
United Kingdom					**0**	31 918	5 287	139 992	29 017
Russia					**0**	*13 492*	*37*	1 339 122	*1 800*
San Marino					**0**			*120*	
Serbia & Montenegro					**0**	*808*		47 376	*20*
Slovakia					**0**	7 819	71	44 983	8 273
Slovenia					**0**	16 938		46 412	1
Sweden					**0**	21 436	17	181 309	283
Switzerland					**0**	*9*		81 626	
Ukraine					**0**	*780*		242 579	
Total	**2**	**20**	**422 641**	**30**	**422 693**	**2 571 916**	**92 260**	**8 571 724**	**342 822**
	0.0 %	0.0 %	100.0 %	0.0 %	**100.0 %**	30.0 %	1.1 %		250 562
World total	**19 569 177**	**28 159 243**	**61 469 448**	**18 842 967**	**128 040 835**	**19 648 752**	**700 233**	**19 372 278**	**817 382**
	15.3 %	22.0 %	48.0 %	14.7 %	**100.0 %**	32.0 %	3.6 %		

Note 1: for EU member countries, imports excluding supplies from European production.

Note 2: differences between import and export totals result from re-exports between non-producer countries (intra-EU trade for example), the taking into account of two years (2012 and 2013) and the experimental nature of this work.

Source: Thierry Lescot of CIRAD, who used bibliographical research, surveys, professional sources, FAO, etc.