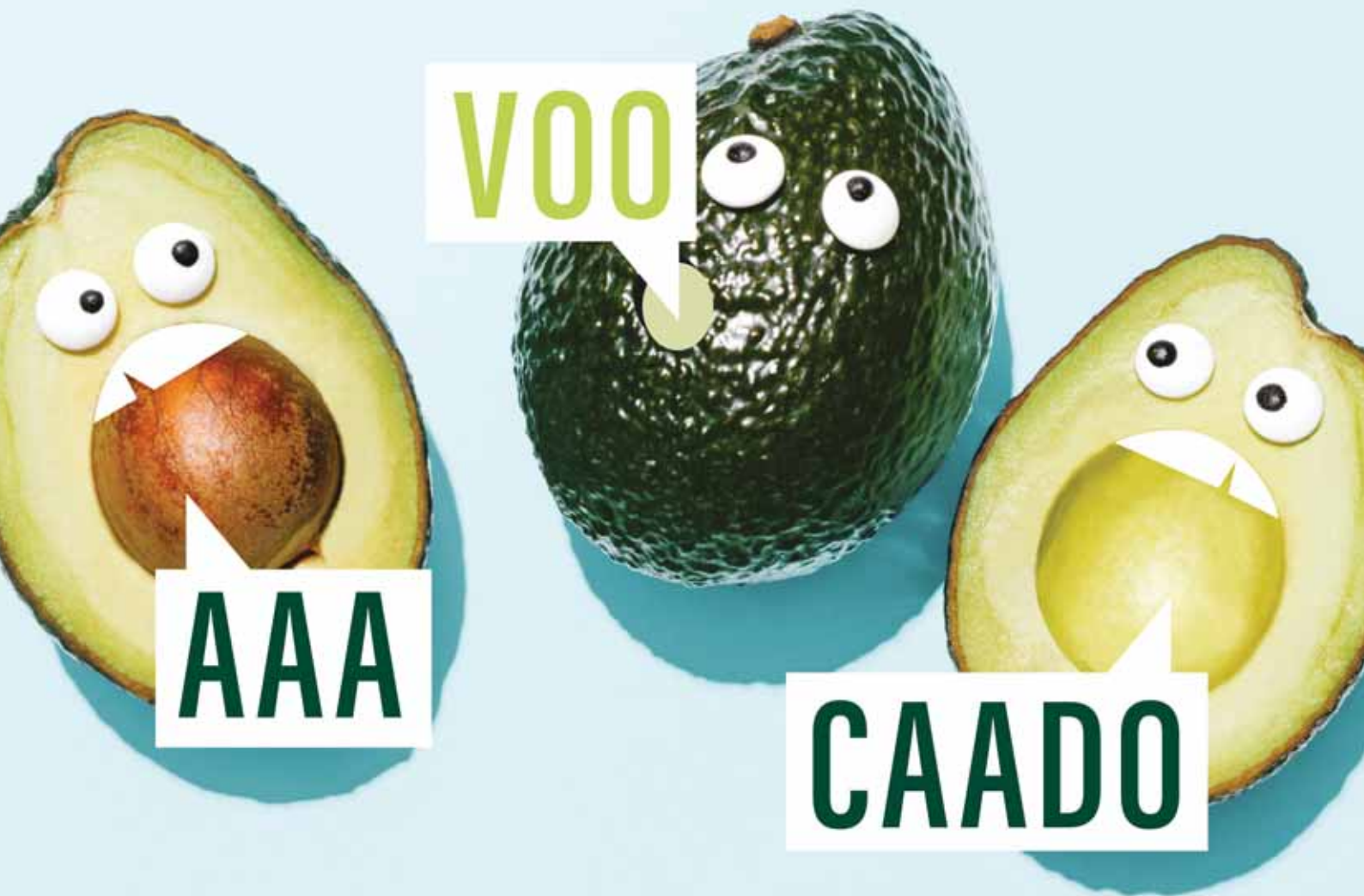


# FR*ui*TROP

MAGAZINE  
— SEPTEMBER 2020 —  
N°271



FORECAST FOR THE 2020-2021

WINTER CAMPAIGN

*Growers at heart!*

The best origins,  
experience and service



MEHADRIN INTERNATIONAL . 696 chemin du Barret, ZA du Barret  
13 160 Chateaurenard . France  
Tel. +33(0)4 32 60 62 90 . Fax. +33(0)4 90 24 82 54  
[benchadod@mehadrin-inter.com](mailto:benchadod@mehadrin-inter.com) . [www.mtex.co.il](http://www.mtex.co.il)

  
**mehadrin**  
Growers at heart

# Editorial



## When the health crisis generates soft law.

The current health crisis is both a trend accelerator and trend indicator, except, of course, for the business sectors struggling for their survival (tourism, air industry, etc.). The European food system in general is definitely the system which has shown the quickest transformation under the effect of the pandemic. Besides the fact that it held up during the peak of the epidemic and during the lockdowns of the first half of 2020 (solid logistics, sufficient stocks, efficient organisation, quick to adapt, etc.), the crisis has confirmed the strategic lines chosen by a large part of the sector. Local, national, health, food safety, agro-ecological, organic, value distribution, fair, etc. are the totems characterising the thousand and one facets of these strategies.

This trend is being accompanied by voluntary standards of sustainability, available in ever increasing numbers. Although the term “voluntary standards” should be suffixed by “but mandatory”, since soft law is imposed all round if the issuer (a supermarket, certifier, NGO, etc.) is perceived to be the most powerful entity in a given sector. This is completely different from universally imposed hard law, i.e. national laws. In any event, there have just been two very different examples to remind us that a standard, voluntary or otherwise, is under constant construction, sometimes even below the radar. And woe betide any operators which failed to spot it coming.

The first involves the revision of the Rain Forest Alliance’s specifications for the banana. It is currently triggering a fierce backlash, especially in Latin America, with the formation of an “anti” front (Banana Cluster), accompanied by some intense lobbying. The upstream operators believe that the new constraints go too far, and that their wishes have not been heard. The second example involves France, for the moment, before we might assume extending to Europe as a whole (see the European Commission’s Green deal). This is the relaunch of the French initiative on environmental (and soon social) labelling on consumer goods, initiated by the Grenelle Environmental Forum in 2009, and then put on the back burner for a while due to the subprimes crisis.

The issue is not to determine whether the content of these standards will represent progress for the most fragile links in the industries, for the environment or for consumers. In this respect, there are rarely pleasant surprises. The point is to determine whether it might not be better for these standards (progress plan and roll-out calendar) to be under the initiative of the growers and commercial operators, rather than of an outside player. This too is unfortunately rarely the case, such is the disarray in their approach to the subject. So there is no point crying foul when outside players seize control of what often becomes a business in its own right.

Denis Loeillet



Annual subscription: EUR 360 pre-tax / [www.fruitrop.com](http://www.fruitrop.com) / [info@fruitrop.com](mailto:info@fruitrop.com)

1 subscription = 2 sources of information

FruiTrop Magazine: 6 issues, paper and .pdf editions

+ FruiTrop online: forecasts, reviews, and news

**Publisher:** CIRAD, TA B-26/PS4, 34398 Montpellier cedex 5, France; Tel: 33 (0) 4 67 61 71 41; Contact: [info@fruitrop.com](mailto:info@fruitrop.com); website: [www.fruitrop.com](http://www.fruitrop.com)

**Publishing Director:** Eric Imbert; **Editor-in-chief:** Denis Loeillet; **Editor:** Catherine Sanchez; **Computer graphics:** Martine Duportal;

**Website:** Actimage; **Advertising Manager:** Eric Imbert; **Subscriptions:** [www.fruitrop.com](http://www.fruitrop.com); **Translators:** James Brownlee and Tradeasy;

**Printed by:** Impact Imprimerie, n°483 ZAC des Vautes, 34980 Saint Gély du Fesc, France

**ISSN:** French: 1256-544X; English: 1256-5458; **Separate** French and English editions; © Copyright Cirad

This document was produced by the Markets News Service of the PERSYST department at CIRAD, for the exclusive use of subscribers. The data presented are from reliable sources, but CIRAD may not be held responsible for any error or omission. Under no circumstances may the published prices be considered to be transaction prices. Their aim is to shed light on the medium and long-term market trends and evolutions. This publication is protected by copyright, and all rights of reproduction and distribution are prohibited.

Cover design: J'artucle



# Contents

- 4 **Direct from the markets**  
EU banana supply – USA banana supply – New ripening centre in France – Booklet publication:  
Biodiversity of banana plantations in Martinique. Spiders – Costa Rican pineapple – Madagascan litchi  
– Spanish citrus – La Niña – Avocado rootstocks – Mexican avocado – New Zealand avocado
- 10 **European persimmon market**  
Spain calling the tune (*Anne-Solveig Aschehoug*)
- 22 **European apples and pears**  
Small apple harvest, and decent pear volumes (*Anne-Solveig Aschehoug*)
- 28 **The banana in Mexico**  
Producer country file (*Noémie Cantrelle, Carolina Dawson*)

## Close-up **Avocado**

*prepared by  
Eric Imbert*

- 42 **World market – Review of summer 2019 and winter 2019-20**  
Stable volumes, but market still exhibiting strong growth
- 48 **Covid-19**  
Impact varying between markets
- 60 **Winter avocado campaign**  
New critical periods to be monitored in the EU-28?
- 62 **Advance review of the summer 2020 avocado season on the EU market**  
A catastrophic scenario
- 64 **Winter 2020-2021 forecasts for the European market**  
One more time?
- 84 **Producer country file**  
The avocado in Chile
- 108 **World Statistics**  
Production, exports, imports
- 110 **Main varieties**  
Hass, Fuerte, Pinkerton, Ettinger, Reed
- 112 **Post-harvest**



# Fruity Flight

OF OUR  
NEW  
IDENTITY



Georges Helfer co.  
has updated  
its visual identity,  
and has relocated  
his core business  
in the center of Rungis

**MIN RUNGIS**  
62 av. de la Villette  
94550 Chevilly-Larue

—  
**GEORGES  
HELPER**  
—

OUR EXPERTISE DESERVES A NEW VISUAL IDENTITY  
MORE IN LINE WITH OUR VALUES



## EU banana supply in July 2020: getting its second wind.

After a big rise in June (+ 12 % on June 2019), in July 2020 the EU's supply was slightly down: - 1.1 %. The African ACP origins had an excellent month, registering 4.3 % growth, while conversely the supply from the other ACPs fell in the same proportions. The dollar origins fell by just 1.5 %, after a 15.9 % climb in June. So the European supply stabilised in July. Nonetheless, over seven months, the market was up by 3.7 %, to 4 018 000 tonnes. And over twelve months (August 2019 to July 2020), EU-28 consumption increased by 141 000 tonnes, setting an absolute record of 6 608 000 tonnes! All the origins, except for the non-African ACPs, were up: + 2 % for the dollar, + 2 % for African ACPs and + 5 % for European production.

Source: CIRAD

### Banana – EU – Supply from January to July 2020\*

000 tonnes	2018	2019	2020	2020/2019
<b>Net supply</b>	<b>3 902</b>	<b>3 873</b>	<b>4 018</b>	<b>+ 3.7 %</b>
<b>Total imports, incl.</b>	<b>3 575</b>	<b>3 521</b>	<b>3 660</b>	<b>+ 3.9 %</b>
MFN	2 971	2 892	3 056	+ 5.7 %
ACP Africa	355	345	333	- 3.5 %
ACP others	249	285	271	- 4.9 %
<b>Total EU production, incl.</b>	<b>327</b>	<b>352</b>	<b>358</b>	<b>+ 1.6 %</b>
Martinique	78	90	83	- 7.9 %
Guadeloupe	15	24	28	+ 17.1 %
Canaries	222	226	234	+ 3.9 %

\* provisional | sources: CIRAD, EUROSTAT (excl. EU local production)

## US banana supply in July 2020: all gone!

The US market saw a huge slip, wiping out the strong growth seen in June, and then some. The net supply plummeted by 13.4 %, leaving a gain of just 1.1 % over seven months. Honduras, Ecuador and Mexico lost ground, while Guatemala and Costa Rica consolidated their positions. Over twelve months, the market stabilised at around 4 125 000 tonnes. Over the first seven months of the year, 11% of the banana supply was declared organic.

Source: CIRAD

### Banana – USA – Supply from January to July 2020\*

in 000 tonnes	2018	2019	2020	2020/2019
<b>Gross supply</b>	<b>2 860</b>	<b>2 777</b>	<b>2 806</b>	<b>+ 1 %</b>
incl. organic	321	263	313	+ 19 %
Re-exports to Canada	335	342	346	+ 1 %
<b>Net supply</b>	<b>2 525</b>	<b>2 434</b>	<b>2 460</b>	<b>+ 1 %</b>

\* provisional | source: US Customs

## New ripening centre in France: SIIM opens France's biggest ripening centre.

SIIM's new ripening facility opened its doors on 31 August 2020, at Rungis market. It is France's biggest ripening site for the banana, mango and other exotic fruits. It is equipped with 42 ripening chambers (total simultaneous capacity 67 lorries, i.e. 1 608 pallets) and a differentiated cold storage space capable of housing 1 000 pallets.

Source: SIIM.net



## Booklet publication: Biodiversity of banana plantations in Martinique. Spiders.

For many years, CIRAD has been conducting research to facilitate the agro-ecological transition of banana cultivation in the French West Indies and worldwide. We can now be encouraged to note that these agro-ecological innovations are helping restore and preserve biodiversity in banana plots previously hostile to many species.

This booklet sets out the results of several years' research conducted by CIRAD to survey the spider biodiversity in Martinique's banana plantations. With a quick look at this booklet, readers can easily identify the most common spiders in banana plantations and gardens. It presents around thirty species, with photos and drawings so that anyone with curiosity on the subject can take a first step toward recognition of these often little known invertebrates, which nonetheless play an important role in maintaining ecological balances.

*Biodiversité des bananeraies de Martinique. Les araignées.* [Biodiversity of banana plantations in Martinique. Spiders]. 2020. Lilou Leonetti, Patrick Maréchal, Mathieu Coulis. Montpellier: Cirad, 32 p., ISBN 978-2-87614-755-3

Downloadable for free from: <https://agritrop.cirad.fr/596285/>



**SUSTAINABLY GROWN CERTIFIED  
&  
CARBON NEUTRAL**

Copyright © 2014 Del Monte Foods Company. All rights reserved. Market News Service of CIRAD – All rights reserved.

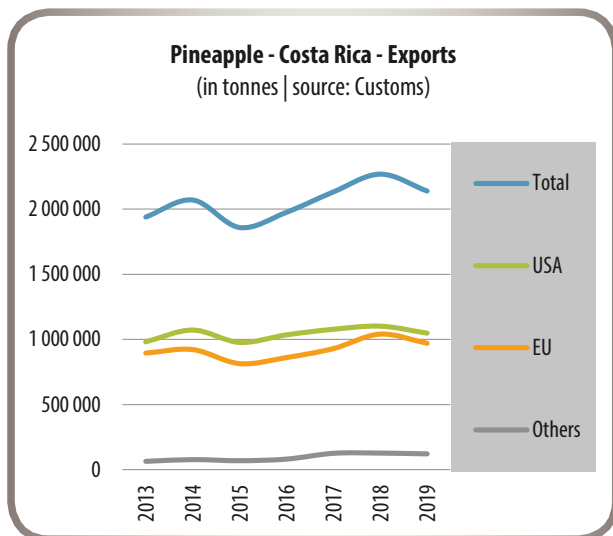
Bananas from Del Monte® plantations in Guatemala and Costa Rica are certified "Sustainably Grown", and Del Monte® Banana operations in Costa Rica are certified "Carbon Neutral" by SCS Global Services.



### Costa Rican pineapple: exports still falling in 2020?

2019 marked a hiatus in the explosive growth dynamic in pineapple exports from the Costa Rican giant. After making constant progress from 2015 to all destinations, peaking in 2018 at more than 2.2 million tonnes, exports registered a downturn of around 130 000 tonnes in 2019. Hence volumes received by the European Union slipped back to 970 000 tonnes, after an absolute record of more than one million tonnes, in 2018. The fall to the USA was less marked, where volumes managed to hold up above the one-million tonnes mark. Over the first seven months of 2020, the downward dynamic seems to be continuing. Exports to all destinations are reportedly 6 % down on 2019, with volumes to the EU-28 (- 12 %) tumbling even more than to the USA (- 1 %), with a particularly acute shortfall in March and April. The Covid-19 crisis and its impact on consumption of tropical fruits were probably partly responsible for this fall in pineapple imports.

Source: CIRAD



### Pineapple – Costa Rica – Exports

in tonnes	2020 (7 months)	comparison	
		2019	last 4-year average
USA	614 444	- 1 %	- 2 %
EU-28	519 460	- 12 %	- 9 %
Others	56 316	- 10 %	- 1 %
<b>Total</b>	<b>1 190 219</b>	<b>- 6 %</b>	<b>- 5 %</b>

Source: Customs



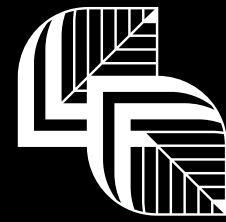
### Madagascan litchi: initial prospects for the 2020-21 season

According to the Toamasina Technical Horticultural Centre (CTHT), Madagascar's litchi production this year is set to be substantial and early. The minimum temperatures registered in July and August were lower than in previous years, contributing to good flowering. Temperatures have climbed slowly from late August onward, but this does not seem to have affected the tree production cycle. For its part, there has been a positive rainfall trend, with higher levels than in previous years. As observations currently stand, production is set to be satisfactory, and above all particularly early. By late September we will be able to refine these production prospects in terms of quantities and fruit growth.

Source: Pierre Gerbaud



© Guy Brehier



**LilotFruits**

A NATURAL WEALTH OF TASTE

BY CAPEXO

# The intense taste

## **VICTORIA - EXTRA SWEET - SUGARLOAF PINEAPPLES**

The sweetest, most delicate, and aromatic varieties, which owe their incomparable taste to their authentic origins: lands of abundance, where we support the growers in preserving their traditional cropping methods. We develop unique know-how and special treatment in the selection, packing and delivery of the fruit in order to meet our own commitments. We work with such a passion so that we can offer you the most delicate tastes.

**CAPEXO** . +33(0) 1 41 73 23 00 . [www.capexo.fr](http://www.capexo.fr)

REUNION  
ISLAND

DOMINICAN  
REPUBLIC

COSTA RICA

GHANA

TOGO

BENIN

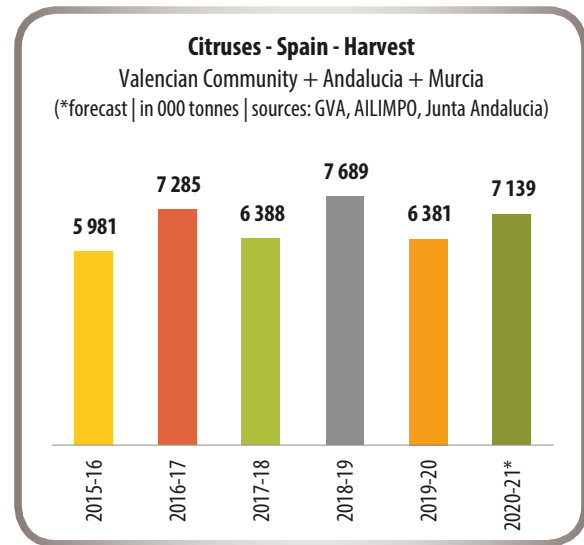
PANAMA



### Spanish citruses: initial forecasts for the 2020-2021 season.

With an expected 7.1 million tonnes this season, the initial estimates published by the Spanish Ministry of Agriculture point to a big recovery in Spanish production in certain citrus families (+ 12 % on 2019-20). However, compared to the four-year average, the 2020-21 season should remain moderate (+ 3 %). Taking a closer look, the easy peelers harvest is verging on its record levels from the 2018-19 and 2016-17 seasons, approximately 10 % above average (2.3 million tonnes), which should be concentrated over the first part of the campaign with the early varieties and Clemenules. Because of structural expansion of cultivation areas, lemon production should be 10 % above average. This production surge should only involve Primofiore (950 000 t, i.e. + 14 % on 2019-20), with the Verna harvest probably remaining slightly smaller than the previous one (300 000 tonnes, i.e. - 2 %). Conversely, orange production is set for a fairly stable level (3.4 million tonnes, i.e. + 4 % on 2019-20), or below the four-year average (- 3 %). There is a similar trend for the grapefruit, whose temporary improvement in production potential (72 000 tonnes, i.e. + 5 % on 2019-20) conceals a fall in yield in terms of the four-year average.

Source: CIRAD



#### Citruses – Spain\* – Harvest forecast

in 000 tonnes	2020-21	2020-21 compared to	
		2019-20	2016-17 to 2019-20 average
Easy peelers	2 369	+ 28 %	+ 10 %
Orange	3 448	+ 4 %	- 3 %
Lemon	1 250	+ 10 %	+ 9 %
Grapefruit	72	+ 5 %	- 5 %
<b>Total</b>	<b>7 139</b>	<b>+ 12 %</b>	<b>+ 3 %</b>

\* Valencian Community + Andalucía + Murcia  
Sources: GVA, AILIMPO, Junta Andalucía



### Climate: High probability of La Niña phenomenon occurring during the 2020-2021 season.

The falling temperatures observed in the Pacific Ocean since June has put the various climate monitoring services on alert. While the waters of the Pacific were bound to continue cooling, with surface temperatures remaining below normal for the season for three consecutive months, this autumn/winter 2020-2021 season is now confirmed to be set for a La Niña episode. This recurrent climate phenomenon which occurs every three or four years, contributes to ocean and atmospheric cooling of the coasts of South America, and has climate impacts which can be transmitted worldwide: cooler from December to February on the coasts of Peru and Ecuador, more abundant rains over North-East Brazil and into Colombia, higher temperatures in the Gulf of Mexico (and consequently a more active cyclone season), and even cooler temperatures in West Africa. Note that during the last La Niña (September 2017 to March 2018), banana production was heavily disrupted by low temperatures in early 2018, especially in Costa Rica and Guatemala. The cold also had impacts on the ramping-up of volumes from the Ecuadorian giant in late 2017/early 2018. Hence a light start to the year, because of the cold, was followed by a particularly heavily laden spring, because of the shift in the production curves. In Peru, while cumulative mango volumes over the 2017-2018 campaign provided a surplus, especially because of the expanding cultivation area, the start of the campaign was greatly delayed by climate conditions. Finally, we cannot help but observe that Cyclones Irma and Maria, which devastated the Caribbean in September/October 2017, also occurred during this climate phenomenon.

Source: CIRAD

© Régis Domergue  
Content published by the Market News Service of CIRAD – All rights reserved





## Avocado rootstocks: Westfalia launches two new benchmark rootstocks.

In early August, Westfalia launched two new rootstocks providing improved productivity under certain stress conditions, as common as they are problematic across much of the world's production zones. Leola™ is exhibiting very good performance in regions with high *Phytophthora* pressure. Zerala™ is for its part highly resistant to salinity. The R&D branch of Westfalia has been working for 40 years in the field of innovative rootstock research. In particular, it has developed the clonal rootstock marketed as Dusa®, which remains to this day the world benchmark for productivity among avocado rootstocks. Leola™ and Zerala™ are jointly owned by Westfalia and the South African Avocado Growers' Association.

Source: Westfalia



## New Zealand avocado: record harvest in 2020-21.

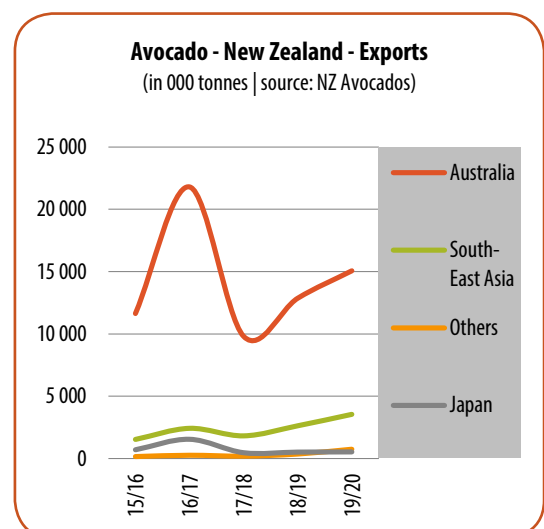
While the 2019-20 season was above the four-year average for both production level (39 000 tonnes, i.e. +30 %) and export volumes (20 000 tonnes, i.e. +16 %), the forthcoming 2020-21 season is set for record figures. With an increase of between 10 and 15 % on last season, production could reach 45 000 tonnes, thereby equalling the 2016-17 record. Nonetheless, the cultivation area has remained practically unchanged since 2015. All the production zones are stable, right across the main zone situated in Bay of Plenty (2 294 hectares in 2019-20), as well as the Far-North and Mid-North zones (548 and 833 hectares respectively in 2019-20). We can estimate that the export potential should also approach its 2016-17 levels (26 000 tonnes). Regarding the outlets, predictions of a smaller Australian harvest in 2020-21 should enable New Zealand to continue to direct 70 to 80 % of its exports there. In addition, despite new import constraints due to the Covid-19 crisis, diversification to the Asian markets should continue. For the past four years, exports to Thailand, South Korea, Singapore and Taiwan have seen big increases.

Source: NZ Avocado

## Mexican avocado: a new express shipping line between Mexico and Europe.

This season, exporters in Jalisco and Michoacán will be able to access a new sea-freight link to Europe, set up by United Producers of Mexico (body responsible for promoting agricultural trade between Europe and Mexico), and operated by Greensea. It has the enormous asset of being able to reach the port of Rotterdam in 12 days from Veracruz. Conventional ships will be used, sailing twice a month (3 000 pallets in the hold, and 24 containers on deck initially). The first departure was on 15 September 2020.

Source: UPM



## Spain calling the tune

*Weighing in at no more than 170 000 tonnes (excluding local consumption), the European persimmon market is dominated by Spain, with Italy trailing a long way behind. Israel has disappeared from the market. South Africa and Brazil provide a small counter-season trade flow. Shipments from Morocco and Turkey will also bear watching.*





Behind a great brand,  
there are always  
great people.

**BOUQUET**

**persiMon®**

P.D.O. KAKI RIBERA DEL XÚQUER



**BOUQUET**

Growing the future



Content published by the Market News Service of CIRAD – All rights reserved

At Anecoop, we are producers and we market our own products.

We work together as one to bring the finest produce from the farm to the table.

This team effort has enabled us to become

the world's leading producer of persimmons with our PersiMon®Bouquet brand.

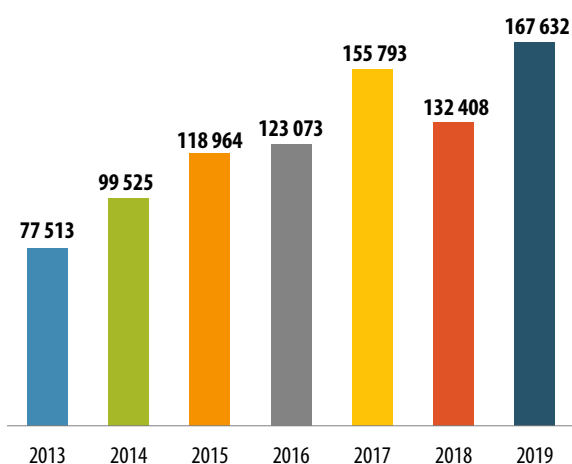
A brand's reputation is forged thanks to the people behind it.





© Guy Bréhiniér

**Persimmon - EU-28 - Intra and extra-Community imports**  
(in tonnes | source: Eurostat)



**P**ersimmon consumption in Europe is seasonal, starting in October and ending in February. Imports into the EU-28 make up around 170 000 tonnes, a volume which seems small compared to other iconic fruits; but to put this into some perspective, back in 2013 it was no more than 78 000 tonnes. This seasonal market is fed mainly by the Spanish persimmon, this origin supplying Europe with 163 000 tonnes in 2019. Italy is the second biggest persimmon supplier, but with only 3 300 tonnes. There is also a small counter-season flow thanks to shipments from South Africa, of 1 400 tonnes. Brazil also plays a role, albeit very modest, with 164 tonnes in 2019.

Another highlight is the tumbling persimmon imports onto the European market from Israel. While in 2013, Israeli volumes reached 1 510 tonnes, in 2019 they were just 31 tonnes.

Hence the European persimmon market is focused on its main supplier, Spain. Its major outlet in Europe is Germany, with more than 52 000 tonnes, followed by Italy (32 000 tonnes), France (24 000 t), the Netherlands, Poland, the United Kingdom and, to a lesser degree, Portugal. We should also note that consumption has been constantly growing in all these countries. While in 2013 German consumption was no more than 350 g/capita, in 2019 this figure had climbed to 637 g. French consumption reached 355 g/capita, as opposed to 143 g in 2013. Consumption in the UK was nearly 180 g/capita, as opposed to 10 g in 2013. Portugal reached nearly 500 g/capita in 2019, as opposed to 280 g in 2013.

In future, we will also need to keep an eye on persimmon shipments from Morocco (33 tonnes in 2019) and from Turkey, since although still small, they are rising year on year.

### Persimmon – EU-28 – Consumption of non-producer countries

in tonnes	2015	2016	2017	2018	2019
Germany	36 486	38 991	44 207	43 253	52 264
France	14 121	14 985	22 401	21 324	22 336
United Kingdom	7 553	6 146	7 279	6 720	12 065
Scandinavia*	5 298	5 021	6 820	4 811	6 674
Baltic States	4 349	6 941	6 616	5 285	6 092
Czech Rep.	1 136	1 788	2 188	1 609	4 124
Slovakia	5	11	4	89	2 653

\* Sweden + Finland + Denmark + Norway | Source: Eurostat

### Persimmon – EU-28 – Intra and extra-Community imports

in tonnes	2013	2014	2015	2016	2017	2018	2019
Spain	73 491	95 247	113 982	118 648	150 508	128 288	162 707
Italy	1 862	2 073	2 954	3 313	3 938	3 253	3 287
South Africa	610	579	1 073	623	757	534	1 411
Brazil	41	58	34	32	89	121	164
Morocco	0	0	12	13	6	0	33
Israel	1 510	1 568	909	445	495	211	31
<b>Total</b>	<b>77 513</b>	<b>99 525</b>	<b>118 964</b>	<b>123 073</b>	<b>155 793</b>	<b>132 408</b>	<b>167 632</b>

Source: Eurostat



© Guy Bréhiniér



## World persimmon production on the rise

According to the latest available data, world persimmon production is more than 4.7 million tonnes, with a cultivation area in excess of 950 000 hectares. Asia leads the way, with more than 4 million tonnes, with China harvesting up to 3.15 million tonnes per year, over a surface area of more than 850 000 ha. Japan has a total of nearly 20 000 ha, producing 208 000 t. South Korea has a cultivation area of 27 200 ha, producing nearly 350 000 t.

With just above 542 500 t produced over 21 100 ha, Europe is a small producer in the face of the combined Asian harvest. However, it exports widely, starting with Spain and Italy. Some operators are saying that there are some orchards expanding in Morocco and Turkey.

Large persimmon cultivation areas can also be found in Central Asia, e.g. in Azerbaijan (10 474 ha producing more than 160 000 t) and Uzbekistan (more than 70 000 t). In Asia Minor, Iran has a cultivation area of 1 523 ha producing around 23 000 t.

In the Americas, Brazil is one of the biggest exporters, with a production level of more than 150 000 t from a cultivation area of more than 8 100 ha. Cultivation areas are expanding in Chile (more than 110 ha) and Uruguay.

## Spain dominating the European market

This is the Mediterranean country with the fastest rising persimmon production, currently representing more than 400 000 tonnes, with nearly 300 000 tonnes sold fresh, and a constantly expanding cultivation area, which has reached more than 18 600 hectares.

Spain has enabled European consumers to rediscover a slightly forgotten fruit, thanks to its abundant supply and a hard-hitting communication campaign on the Rojo Brillante variety.

In the 1990s, the Spanish persimmon was sold overripe, mainly in Portugal. With the crisis on the citrus market, especially the Naveline orange, most of whose orchards were situated in southern Valencia, some growers switched to persimmon production. Since the first sales were convincing, Spanish growers started massive planting of persimmon trees. Spanish technical teams found the solution to eliminate the astringency of the Rojo Brillante variety, a firm fruit which keeps well and can be transported over long distances. These new post-harvest techniques have made it possible to develop its cultivation further in an agricultural area in search of alternative crops: the Alcúdia and Carlet region 30 km south of Valencia (Ribera del Xúquer) was the historic production centre for the Naveline orange. There are also persimmon orchards in the province of Castellón and around Sevilla in Andalusia.





## Rojo Brillante, Spain's flagship variety

Twenty years ago, persimmons were grown in eastern Spain, isolated in family gardens, orchards or small plantations for local consumption. Earlier in the 20th Century, small orchards were set up with native cultivars such as Tomatero, Picudo (Costata) and Cristalino, cultivars from Valencia province. During this period, a new cultivar was identified in the "Ribera del Xúquer" region, Rojo Brillante, which owes its name to its attractive shiny colour. The quality of this new PVA cultivar (pollination variant astringent), as well as the development of new post-harvest techniques, helped eliminate the fruit's astringency, revolutionising the cultivation and trading of the persimmon, leading to new ways of consumption and marketing. The Spanish persimmon is now sold right across Europe. Rojo Brillante can even be found in the Gulf States, and a few tonnes have even appeared in the world number one producer country, China!

**Persimmon – Spain – Evolution of areas in the main producing regions**

in hectares	2015	2016	2017	2018	2019
Valencia	14 659	15 520	15 977	15 891	15 922
Andalusia	1 498	1 578	1 630	1 316	1 407

Source: mapa

To protect persimmon cultivation, in 1998 Spain obtained PDO recognition for the "Ribera del Xúquer" persimmon, from its historic production area. This means that nearly 50% of Spanish-produced fruit can be marketed with an official quality mark.

## The main persimmon varieties

Persimmons are classified in two categories, astringent fruits becoming sweet upon maturing, and non-astringent fruits, and are divided into four classes (PCNA, PVNA, PVA, PCA):

- **The non-astringent varieties**, also known as **PCNA** (Pollination Constant Non Astringent). These persimmons can be consumed ripe, like an apple. There are two main PCNA varieties:

**Jiro**, which is a Japanese variety. The tree is medium vigorous, and has good cold resistance. The harvest matures early (late October). This variety yields a very well-sized fruit, square, flattened and ribbed in shape, and with good taste quality;

**Fuyu**, which is also a Japanese variety. The variety has low vigour. The fruit remains fairly firm even close to physiological maturity. Smaller in size than Jiro, the fruit is flattened and round, and with good taste quality.

- **The astringent varieties** are divided into three classes:

**PVNA** (Pollination Variant Non Astringent),

**PVA** (Pollination Variant Astringent),

**PCA** (Pollination Constant Astringent).

The astringency means that we have to wait for complete physiological maturity of the fruit, resulting in a big loss of firmness. Hence harvesting is very delicate, with the fruit becoming practically deliquescent, its viscous sticky texture not universally popular among consumers.

At present, the majority of persimmons produced are astringent varieties such as Muscat de Provence, Nikita's gift, Tomatero, Chocolate, Honan Red, Hatchiya. But there is only one highly economic important variety, Rojo Brillante, the most widespread commercial variety. The tree is highly vigorous and high-yielding (20 to 40 tonnes per hectare in Spain). The fruit is oval, large sized and of good taste quality, though astringent.

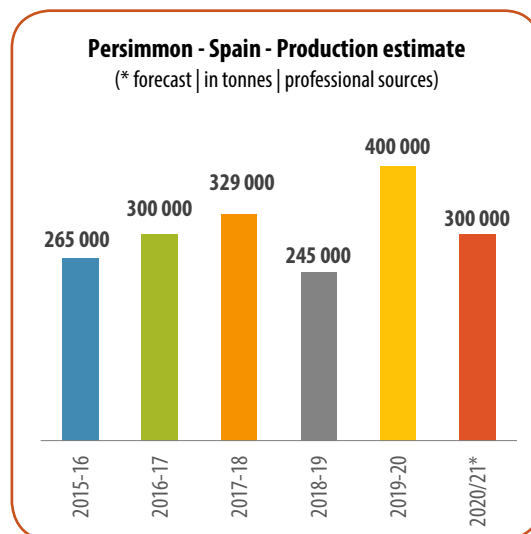


## Production expected to fall 30 % in 2020

This season, which will start in late September, Spanish production is expected to fall 30 % from last year, with fresh volumes on the market set to drop below 300 000 tonnes. The main reason for this downturn is due to the unusual climate conditions registered in spring. The record for rain and days cloud cover caused massive fruit droppage during flowering and fruit-setting.

The agricultural organisation Asaja Valencia reported severe losses of nearly 50 to 90 % of the total production in some zones such as La Costera, Los Serranos, Horte Sud and even in the south of La Ribera Alta, the main production region in Valencia province, and therefore Spain.

Furthermore, growers are highlighting a fall in production due to the appearance of pests and diseases (cotonet, whitefly and thrips) because of restrictions in the use of phytosanitary products imposed by European regulations, with in particular the end of the marketing authorisation of chlorpyrifos and chlorpyrifos-methyl. This decision was taken because of the confirmation by the European Food Safety Authority (EFSA) of their harmful effects for human health, in particular genotoxicity, and their neurotoxic effects on development.



## When will the Russian market be reopened?

Meanwhile, the agricultural union for Valencia province, Ava-Asaja, wrote to the Spanish Agriculture Adviser, Mirela Molla, asking her to take fiscal measures to support persimmon growers, and to ensure that there is a sufficient, genuinely effective range of phytosanitary and biological products to combat the pests destroying the crops. Spanish operators have also asked political and administrative officials to do what it takes to reopen the Russian market, and try to prevent the application of Customs duty on the entry of European fruit, especially Spanish fruit, from 1st January 2021 to the British market because of Brexit. They have also asked for new export markets to be opened up.

On the issue of the closure of the Russian market to European fruits and vegetables, Spanish producers and exporters have found a counter-measure: a large quantity of fruits is being sent to countries bordering Russia, such as Belarus, Lithuania or Latvia.

In Spain, there are new research prospects in progress. Growers are working on improving existing varieties, to extend the production calendar, bringing forward the harvest to start in August, and to improve the cold storage to extend persimmon trading until February. A big Spanish persimmon promotion campaign is planned for the European market, to try to further spread this lesser-known fruit.

## Italian cultivation area still stable

Formerly Europe's number one persimmon producer country, Italy has been overtaken by Spain. From more than 100 000 tonnes in the late 1940s, production shrunk to 70 000 tonnes in the 1960s. In 2019, the level was no more than 51 000 tonnes, with acute competition between the two main production regions, Emilia-Romagna and Campania. Sicily is the number three production region by volume, closely followed by Venezia. The Tipo variety is one of Italy's most important cultivars, although nowadays Rojo Brillante can also be found.

Most of the Italian persimmon crop is consumed locally. Switzerland is the biggest export customer, with more than 1 000 tonnes in 2019, followed by Lithuania (733 t), Slovenia (717 t), Austria (nearly 600 tonnes), the Czech Republic and finally France (255 t).

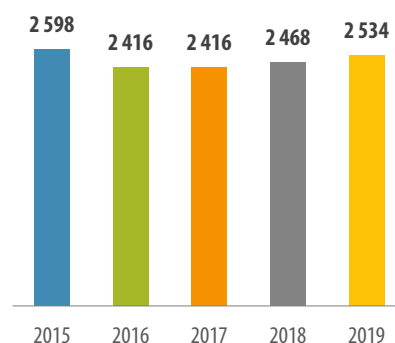
### Persimmon – Italy – Evolution of areas in the main producing regions

in hectares	2015	2016	2017	2018	2019
Emilia Romagna	959	1 008	987	1 030	1 079
Campania	937	941	940	934	926
Sicilia	276	290	308	308	318
Venezia	114	114	121	135	144
Other regions	37	63	60	61	67
<b>Total</b>	<b>2 323</b>	<b>2 416</b>	<b>2 416</b>	<b>2 468</b>	<b>2 534</b>

Source: CSO Servizi

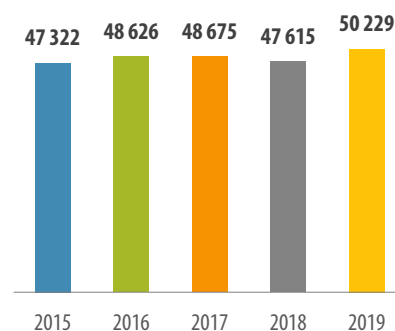
### Persimmon - Italy - Evolution of areas

(in hectares | sources: CSO, FAO)



### Persimmon - Italy - Evolution of production

(in tonnes | sources: CSO, FAO)



## French cultivation area expanding around the Mediterranean rim

In what is a tight economic context for certain arboriculture industries, diversification may help secure the economic balance of farms. Crops such as the persimmon may be useful, since they are suited to the agro-climatic conditions of the Mediterranean. The persimmon is a hardy species with low sensitivity to bio-aggressors, and which readily lends itself to organic cultivation.

Hence persimmon cultivation may be an asset for organic farms, since the French market demand for organic persimmons exceeds the supply. This demand is focused primarily on fruits consumed firm, whether in non-astringent varieties, or varieties where astringency has been eliminated. Varietal trials are currently being conducted in France on astringent Rojo Brillante, Fuyu NA and Jiro NA. But researchers would also like to test Chocolate and Hachiya.

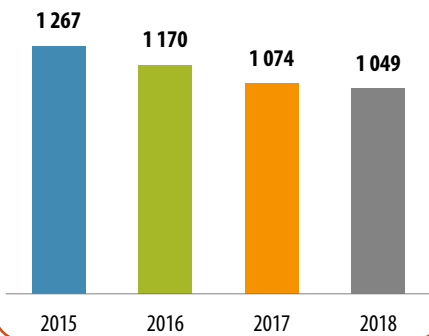
In recent years, growers in the Pyrénées-Orientales Department have banked on the persimmon, with the non-astringent varieties Fuyu and Jiro. These orchards are organically cultivated. For the moment surface areas are small (10 ha), but the growers are planning to expand them. In 2020, for their third year on the market, the predicted production level is nearly 30 tonnes. Eventually, they are hoping for volumes of up to 400 t.

## An event dedicated to the persimmon in 2021

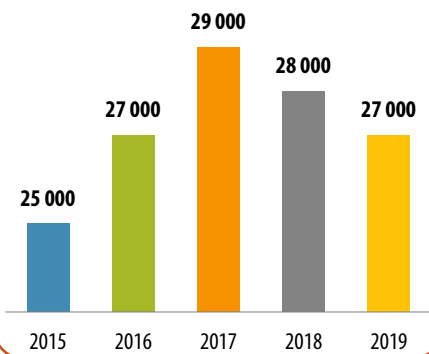
Next year, the 7th International Persimmon Symposium will be held in Nara (Japan), from 22 to 26 September 2021.

To find out more: <http://kaki2020.jshs.jp>

**Persimmon - Israel - Evolution of areas**  
(in hectares | source: FAO)



**Persimmon - Israel - Evolution of production**  
(in tonnes | sources: FAO, CBS.GOV.IL)



## Israel still in the export race

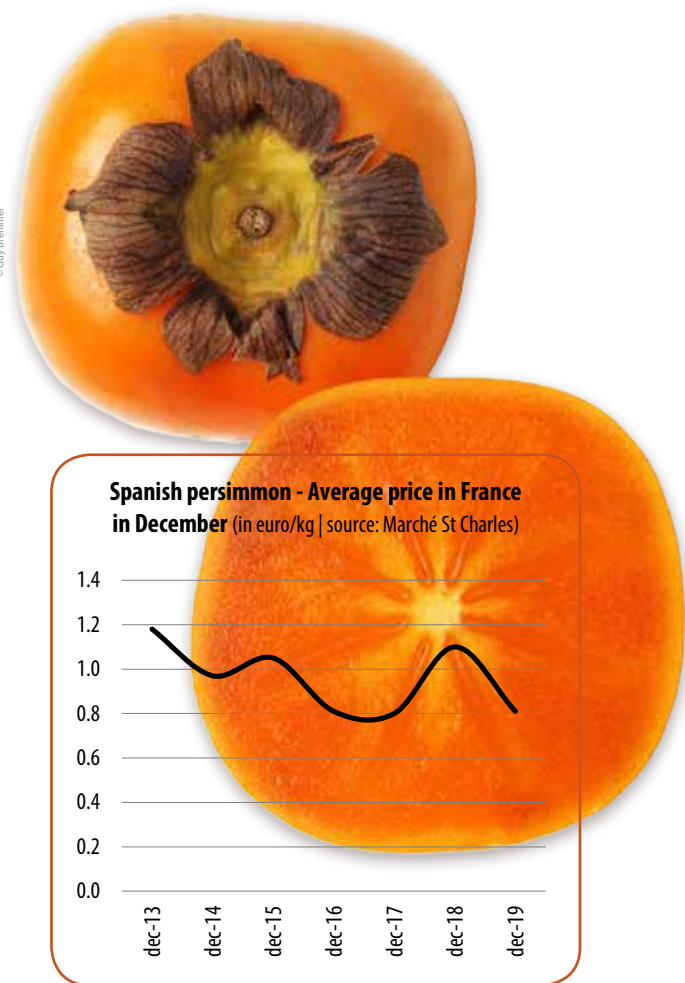
Persimmon cultivation in Israel dates back to the late 1970s, with the appearance of new post-harvest technique to remove the astringency from the fruit using carbon dioxide (CO<sub>2</sub>), a technique which also extends the lifetime of the fruit in cold storage. In the mid-1980s, the cultivation area was less than 1 200 ha, while production was in excess of 8 000 tonnes, with half exported. According to the latest registered data, the cultivation area extends over 1 050 ha, with a production level of 28 000 tonnes. This year, production is set for a 30 % fall, according to operators.

The persimmon is officially known as the “Sharon fruit” in Israel because of the location of the majority of the orchards in the Sharon valley. The main variety is Triumph, a PVA variety (pollination-variant astringent). According to certain authors, this variety is particularly sensitive to high temperatures, which can cause abundant fruit droppage.

Despite its loss of momentum on the European market, the Israeli persimmon remains predominant on the Russian and US markets. Russia is the main export customer, with a dizzying rise in recent years because of the Russian embargo on European fruits and vegetables, which has completely undermined the Spanish persimmon market, and enabled certain competing exporters to take their place on a flourishing market. The USA represents the second biggest Israeli persimmon market, with nearly 930 tonnes in 2019.







## European market favoured by the South African persimmon

The agricultural history of the persimmon in South Africa is linked to that of Israel, especially with the planting of the Triumph variety. It was in the mid-1990s that South African persimmon production took shape, thanks to the marketing initiatives of a big Israeli exporter, which wanted to boost the shelf presence of the persimmon, with counter-season production to the Mediterranean harvest. The South African persimmon is harvested from mid-April to late May, with the fruit available for sale until August.

The majority of orchards are situated south of the Cape, and some in Western Cape. The fruit is shipped for packing and treatment to Buffeljagsrivier, near Swellendam in Western Cape. While some volumes are sold on the domestic market, they are mainly aimed for sea-freight export out of the port of Cape Town.

Europe remains the favoured market for the South African persimmon. While sales to the Netherlands have been falling in recent years, they are rising slightly to the UK. There are some flows to Canada, the United Arab Emirates, Russia, Singapore and Saudi Arabia ■

**Anne-Solveig Aschehoug**, consultant  
annesolveig2@yahoo.fr

## Post-harvest treatments on astringent varieties

Anti-astringency post-harvest treatments produce an accumulation of ethanal (acetaldehyde) in the flesh of the fruit, which reacts with tannin to produce an insoluble gel. Astringency is no longer perceptible below the threshold 1.0 mg/g MF of soluble tannins. The disappearance of tannins means that the fruit can be consumed firm, harvested prior to physiological maturity. The treatments are applied after preservation, immediately before or after packing.

The main techniques work based on the same principle: asphyxiating the fruit. This involves eliminating astringency with alcohol, or with CO<sub>2</sub>.

### Eliminating astringency with alcohol

The fruit is first stored in an airtight enclosure at between 15°C and 20°C. 33° alcohol is spread onto the ground (5 to 10 litres per tonne of persimmon), which evaporates within the enclosure. This treatment lasts 2 to 4 days (depending on the fruit maturity and temperature). The astringency disappears completely 24 hours after removal from the enclosures.

The advantages of this technique are ease of application, the low cost (0.01 euro/kg), its suitability for small harvest volumes and its acceptability for organic agriculture labels. However, it does have some drawbacks, such as the need for customs declaration and the traceability management of the alcohol, the treatment time, the high impact on fruit maturation and above all the fact that it is unsuitable for large volumes.

### Eliminating astringency with CO<sub>2</sub>

The fruit is stored in an airtight enclosure at between 20°C and 25°C. The CO<sub>2</sub> must be injected at a rate of 98 %. The treatment time varies between 15 and 24 hours (depending on the fruit maturity and temperature). The treatment is rapid, since the astringency disappears as soon as the fruit is taken out of the chamber. It is suitable for large volumes and has a low impact on fruit maturation. Conversely, it requires a high technical level, a substantial installation cost and is unsuitable for small workshops.

Source: SudExpé, Xavier Crété, December 2019



*Tissue culture production of tropical fruit plants*  
*Your banana tissue culture plant specialist*



# **A unique range of elite varieties**

## **What we promise you**

The most productive selected elite varieties  
Prime bunch quality  
Optimum homogeneity in the field  
The best sanitary guarantees of the market  
Unequaled responsiveness



**Tel: +33 (0)4 67 55 34 58**  
**Fax: +33 (0)4 67 55 23 05**  
**vitropic@vitropic.fr**

*ZAE des Avants*  
*34270 Saint Mathieu de Tréviérs*  
**FRANCE**  
*www.vitropic.fr*

Content published by the Market News Service of CIRAD – All rights reserved





## History of the persimmon

The persimmon, also known as the kaki or Sharon fruit, is the fruit from the Japanese persimmon tree (*Diospyros persimmon*), part of the Ebenaceae family. In Ancient Greek, *Diospyros* means “divine fruit”. We can find traces of its cultivation from the Neolithic in Southern China, and its name has been mentioned for 2 500 years. Two domestication centres have been discovered: China and Japan, where it appeared in the 7th Century, with the name kaki in fact derived from Japanese.

The national fruit of Japan and South Korea, the persimmon spread worldwide during the 19th Century. Hence it is cultivated in Brazil, and several South American countries (Chile and Uruguay) have entered the persimmon planting race. It is also cultivated in South Africa, Vietnam, Taiwan, Lebanon, Iran, Israel, Italy, Spain, Portugal, the USA, in southern France and Corsica, and as far as North Africa and Turkey.

Today there are more than 2 800 varieties and cultivars, including the two main commercial varieties: Rojo Brillante and Triumph. We can also find the American persimmon (*Diospyros virginiana*), which grows in the States from the north of the Gulf of Mexico to the central Pennsylvania and the central Illinois. The fruit, which measures 3 to 5 cm in diameter rather flattened and dark red or brown coloured. The majority of fruits have numerous flat seeds.

## Persimmon cultivation

Persimmon trees are deciduous, with a low chilling requirement. In the dormancy period, the tree can withstand temperatures ranging from -15°C to -20°C. The leaves, coriaceous and shiny, and bluish green coloured, turn bright yellow and deep orange in winter before dropping off. This species is highly sensitive to wind, which can augment physiological droppage. The branches are fragile and brittle, and the fruits highly sensitive to friction from the branches (marks on the skin). The trees are pruned annually since if they are not pruned, they can reach a height of up to ten metres. They start bearing after three years, but enter full potential after eight years. The life expectancy for trees in good health is nearly forty years. An orchard at full potential can yield around 50 tonnes per hectare in certain major production zones. The fruits are parthenocarpic (forming without the flower being pollinated), and so are seedless. Persimmons are climacteric, and harvesting takes place in October-November.

### Rootstocks

There are three main rootstocks for the persimmon:

- *Diospyros kaki* PG, the oldest, is used above all in Japan and China. It is medium to highly vigorous, but is incompatible with the Fuyu variety. It is highly sensitive to excess moisture, cold and drought. It has low sensitivity to *Pseudomonas* spp and *Agrobacterium tumefaciens*.



- *Diospyros lotus* L is currently the most widely used. It is cold and drought-resistant, and has medium sensitivity to *Pseudomonas* spp. It is highly suitable on all soil types.
- *Diospyros virginiana* L is highly vigorous. It is highly resistant to cold and asphyxiated soils, and is the most resistant to *Pseudomonas* spp.

### Budding, flowering, fruit-setting

Budding takes place in April. Afterwards, if the temperatures drop below 0°C, it may cause serious damage to harvests. Flowers appear on the year's sprouts, with three types on the same tree: female, male and hermaphrodite. The main cultivated varieties have female flowers only. Flowering takes place during the spring, and the fruits reach maturity at the end of autumn.

Fruit-setting can be tricky. Sometimes considerable fruit droppage may occur from flowering until the fruit reaches 40 mm. This may be due to excessive water availability, a lack of light during flowering, a pollination problem, a nitrogen surplus or deficiency, excess growth or phosphorus or boron deficiency.

Hence it is preferable to apply a slight water stress to the orchard between May and mid-August. Growth and nitrogen fertilisation management should be provided. It is preferable to check nitrogen availability in the autumn to put



together reserves. Phosphorus availability must be monitored, and leaf inputs of 2 % boron applied upon flowering.

In terms of orchard management, the preferred method should be staking on double-axis 2 x 4 m iron wire or 2 x 5 m Tatura. As for pruning, persimmon bears fruit on the end buds of the annual sprouts. The fruit-bearing pruning, conducted every year, is to renew the fruit-bearing branches.

### Thinning

Manual thinning is not generally useful, since physiological droppage regulates the tree load. The various varieties bear fruit ranging from orange yellow to dark red. They vary in size from 1.5 to 9 cm in diameter, and are spherical to oval in shape, or also pumpkin shaped. The majority of persimmons are flattened on the top, with square faces and a similar shape to a large tomato. The skin is smooth and edible.

### Irrigation

The persimmon is a species tolerant to water stress and drought. Water requirements are around 450 mm per year, with a crucial period from June to September. The excess water can greatly increase physiological droppage. Single-line drip irrigation yields very good results.

Source: SudExpé, Xavier Crété, December 2019

## Main pests and diseases

The persimmon is a hardy crop which has practically no bio-aggressors. The orchards generally do not require phytosanitary treatments, which makes for easy organic cultivation. The short list of diseases and pests are:

- **Circular leaf spot (*Mycosphaerella nawae*)**. This fungus has not yet been detected in France, but it is present in Spain. Its main symptom is the appearance of necrosis spots on the leaves, which cause defoliation of the tree, and fruit droppage. Preventive management consists in removing the leaves or shredding them. Regarding chemical management, winter treatments are ineffective. There is no curative management; once symptoms appear, there is nothing more to be done. Chemical management can only be applied during the ascospore spreading period from late March to mid-July. Applications should be carried out before the rains, or every half-month. Effective products are copper, sulfur and Difenoconazole, Mancozebe, Pyraclostrobin and Azoxistrobin;
- **Mediterranean fly (*Ceratitis capitata*)**. It attacks fruit by laying its eggs, and the larva then feeds on the pulp. This pest is currently present in France around the Mediterranean rim. It is the main source of concern for persimmon cultivation, since the fruit is no longer fit for sale once infested. Large-scale protective trapping is proving highly effective;
- **Honeydew moth (*Cryptoblabes gnidiella*)**. It may also cause damage to the fruits, but at present it remains restricted to the Mediterranean regions;
- **Obscure mealybug (*Pseudococcus viburni*)**. It can also occasionally attack the orchards, just like the black scale (*Saissetia oleae*).

Other diseases may attack persimmon crops: anthracnose (*Colletotrichum horii*), oidium (*Phyllactinia kակicola*), Wilt (*Nalanthamala diospyri*).

Source: SudExpé, Mathilde Leroy and Xavier Crété, December 2019

## Nutritional values

The persimmon provides mainly carbohydrates (14.3 %), entirely in the form of sugars, with an energy level of 270 to 360 kJ per 100 g, which puts it in the same category as cherries and the grape. It is a source of fibres, with more than 3 g per 100 g.

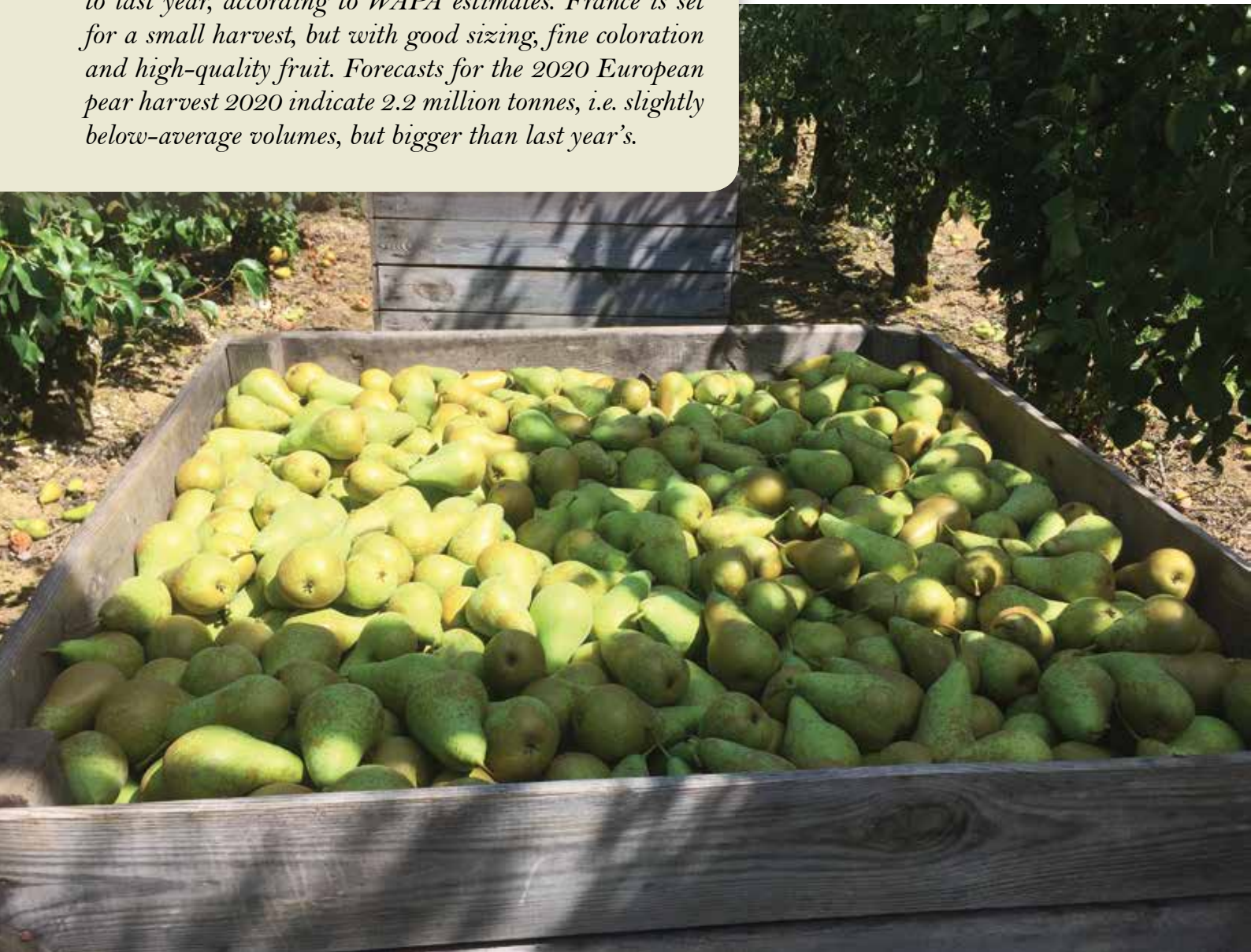
The persimmon is rich in vitamins. The vitamin B1 (thiamine) present in the fruit covers 23.6 % of standard nutritional values. We can also find vitamin B2 (riboflavin), B3, B5, B6, B9, C and E and carotenoids ( $\beta$ -carotene, lycopene, myristic acid ester and  $\beta$ -cryptoxanthin). The three trace elements and minerals most abundant in persimmon are potassium, manganese and copper. The persimmon is the fruit which contains the least total polyphenol. Yet it contains numerous anthocyanins, particularly in young fruit.

Source: Aprifel



## Small apple harvest, and decent pear volumes

*The European apple harvest level should be comparable to last year, according to WAPA estimates. France is set for a small harvest, but with good sizing, fine coloration and high-quality fruit. Forecasts for the 2020 European pear harvest 2020 indicate 2.2 million tonnes, i.e. slightly below-average volumes, but bigger than last year's.*





AZ FRANCE

# OUR FRENCH PEARS

100 %  
ECORESPONSIBLE  
CERTIFIED ORCHARDS

ZERO PESTICIDE  
RESIDUE



ORGANIC

HIGH ENVIRONMENTAL  
VALUE

THANKS TO OUR GROWERS FOR THEIR COMMITMENT



AZ FRANCE

contact@azfrance.fr - tel +33 (0) 4 90 06 66 00



# Apples

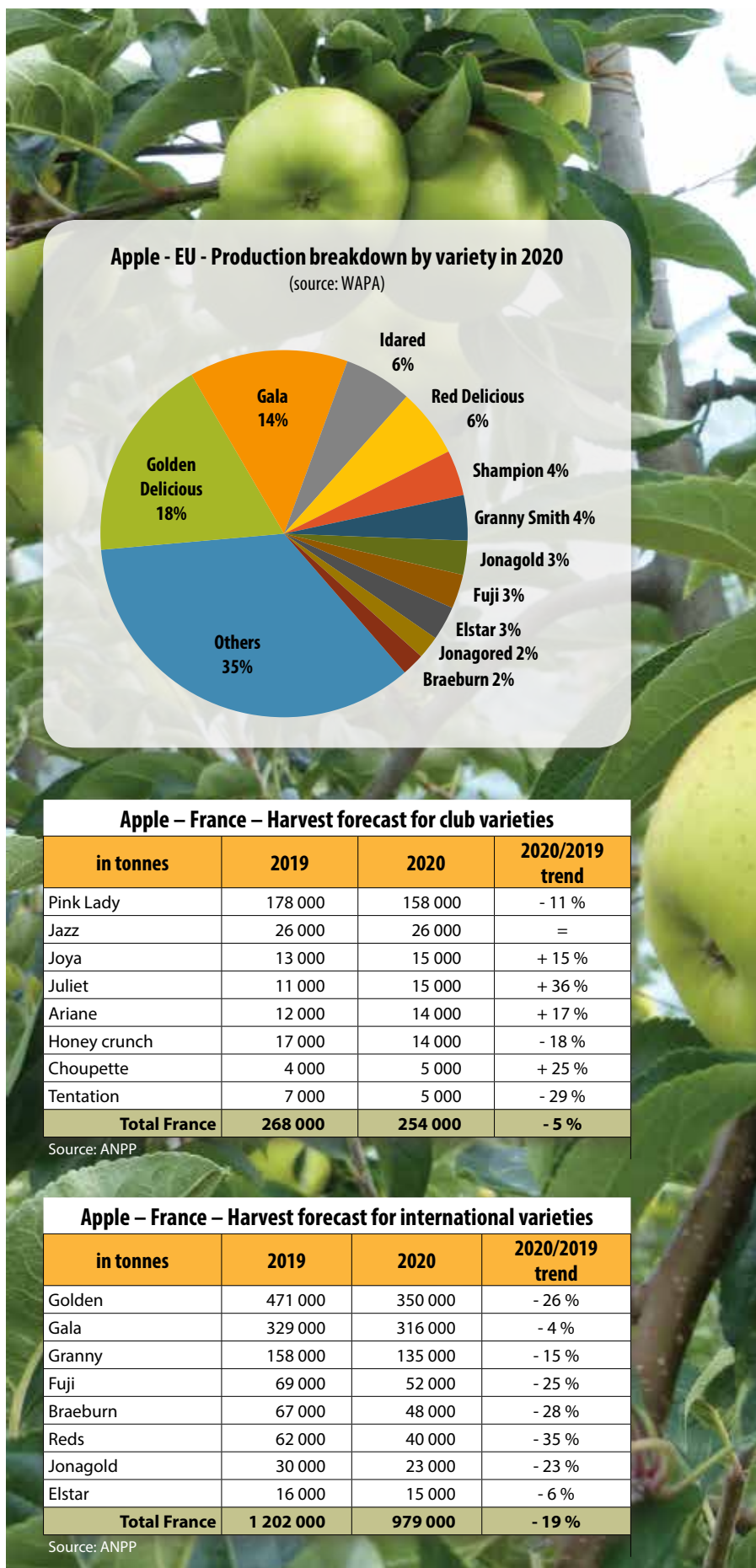
The estimated European apple harvest is 10.7 million tonnes, a comparable level to last year, but below the usual European potential of 13 million tonnes. Poland is registering a big fall, with its harvest down to 3.4 million tonnes, 55 % of which will be aimed at the industrial sector, with the fruit hit by very heavy frosts. Hungary has a shortfall, while Romania and the Czech Republic are seeing their volumes rise. The Italian harvest will be smaller, at 2.1 million tonnes, and of fine quality. Germany is set for smaller volumes, and Spain for a modest harvest. The club and local varieties are on the increase, though without any bumper harvests. The international varieties are set for a fall of 6 % across Europe, except for Gala.

On 27 August, the National Apples and Pears Association (ANPP) revealed the initial harvest and market trends for the French apple. With 1.4 million tonnes forecast, France is expecting a small harvest, though with good sizing, fine coloration and high-quality fruit. This fall is due to a moderate alternate bearing effect and to poor flowering. Golden is down by 19 % from last year, to 350 000 tonnes. The club varieties are set to fall by 5 % by volume to 254 000 tonnes, but orchard surface areas for these varieties have increased.

## An export market to monitor

French operators are announcing big flows of Southern Hemisphere apples to the Middle East (United Arab Emirates, Saudi Arabia, Qatar). They reckon that the market is not picking up very quickly at the beginning of this campaign because of suspicions of large stocks from the Southern Hemisphere.

Furthermore, the operators will need to factor in the future Customs conditions with regard to the UK because of Brexit, as of 1st January 2021. The issue of any Customs duty is being addressed, and it remains to be seen whether the other producer countries will be subject to the same Customs requirements. Uncertainties remain over the probable fall in purchasing power throughout Europe and worldwide because of the Covid pandemic. Currency parity is doubtless something to keep a close eye on, since it could also disrupt the market.



Apple – Europe – Harvest forecast for club varieties			
in tonnes	2019	2020	2020/2019 trend
Pink Lady	289 000	277 000	- 4 %
Kanzi	70 000	na	
Jazz	43 000	na	
Ambrosia	22 000	24 000	+ 9 %
Junami	20 000	na	
Honey Crunch	17 000	14 000	- 18 %
Evelina	15 000	na	
Envy	13 000	16 000	+ 23 %
Juliet	12 000	14 000	+ 17 %
Joya	7 000	9 000	+ 29 %
Greenstar	8 000	na	
Others	132 000	330 000	na
<b>Total Europe</b>	<b>648 000</b>	<b>682 000</b>	<b>+ 5 %</b>

Source: ANPP

Apple – Europe – Harvest forecast for international varieties			
in tonnes	2019	2020	2020/2019 trend
Golden	2 261 000	1 964 000	- 13 %
Gala	1 439 000	1 490 000	+ 4 %
Jonagold	1 140 000	1 068 000	- 6 %
Reds	678 000	660 000	- 3 %
Granny	372 000	369 000	- 1 %
Elstar	363 000	312 000	- 14 %
Fuji	316 000	294 000	- 7 %
Braeburn	286 000	257 000	- 10 %
<b>Total Europe</b>	<b>6 855 000</b>	<b>6 414 000</b>	<b>- 6 %</b>

Source: ANPP

Apple – Europe – Harvest forecast by main producer countries								
in tonnes	2016	2017	2018	2019	2020	2020/2019 trend	2016-2019 average	2020/average trend
Poland	4 035 000	2 870 000	4 810 000	2 910 000	3 400 000	+ 16.8 %	3 656 250	- 7.0 %
Italy	2 272 000	1 704 000	2 264 000	2 096 000	2 080 000	- 0.8 %	2 084 000	- 0.2 %
France	1 515 000	1 424 000	1 477 000	1 651 000	1 431 000	- 13.3 %	1 516 750	- 5.7 %
Germany	1 033 000	597 000	1 093 000	991 000	951 000	- 4.0 %	928 500	+ 2.4 %
Spain	495 000	480 000	476 000	555 000	467 000	- 15.9 %	501 500	- 6.9 %
Hungary	498 000	530 000	782 000	452 000	350 000	- 22.6 %	565 500	- 38.1 %
Netherlands	317 000	228 000	267 000	272 000	234 000	- 14.0 %	271 000	- 13.7 %
Belgium	234 000	88 000	231 000	242 000	167 000	- 31.0 %	198 750	- 16.0 %
<b>Total</b>	<b>11 834 000</b>	<b>9 251 000</b>	<b>13 275 000</b>	<b>10 783 000</b>	<b>10 711 000</b>	<b>- 0.7 %</b>	<b>11 285 750</b>	<b>- 5.1 %</b>

Source: WAPA



## Pears

The prospective European pear harvest has been calculated at 2.2 million tonnes, i.e. slightly below average, but bigger than last year. The leading European producer country, Italy, is announcing a bigger Abate Fetel harvest than in 2019, of 642 000 tonnes as opposed to 363 000 tonnes in 2019, a very long way from the considerable volumes from previous years, which reached 740 000 tonnes. This drastic fall is due to multiple climate and health incidents.

The Dutch harvest will be similar to 2019. Conversely, in Belgium, growers are announcing a fine harvest, bigger than last year's. Spain's expected volumes are down. The summer pears harvest (Williams Coscia and Guyot) will be above average, while for autumn-winter pears, Abate Fetel will see its volumes double from 2019.

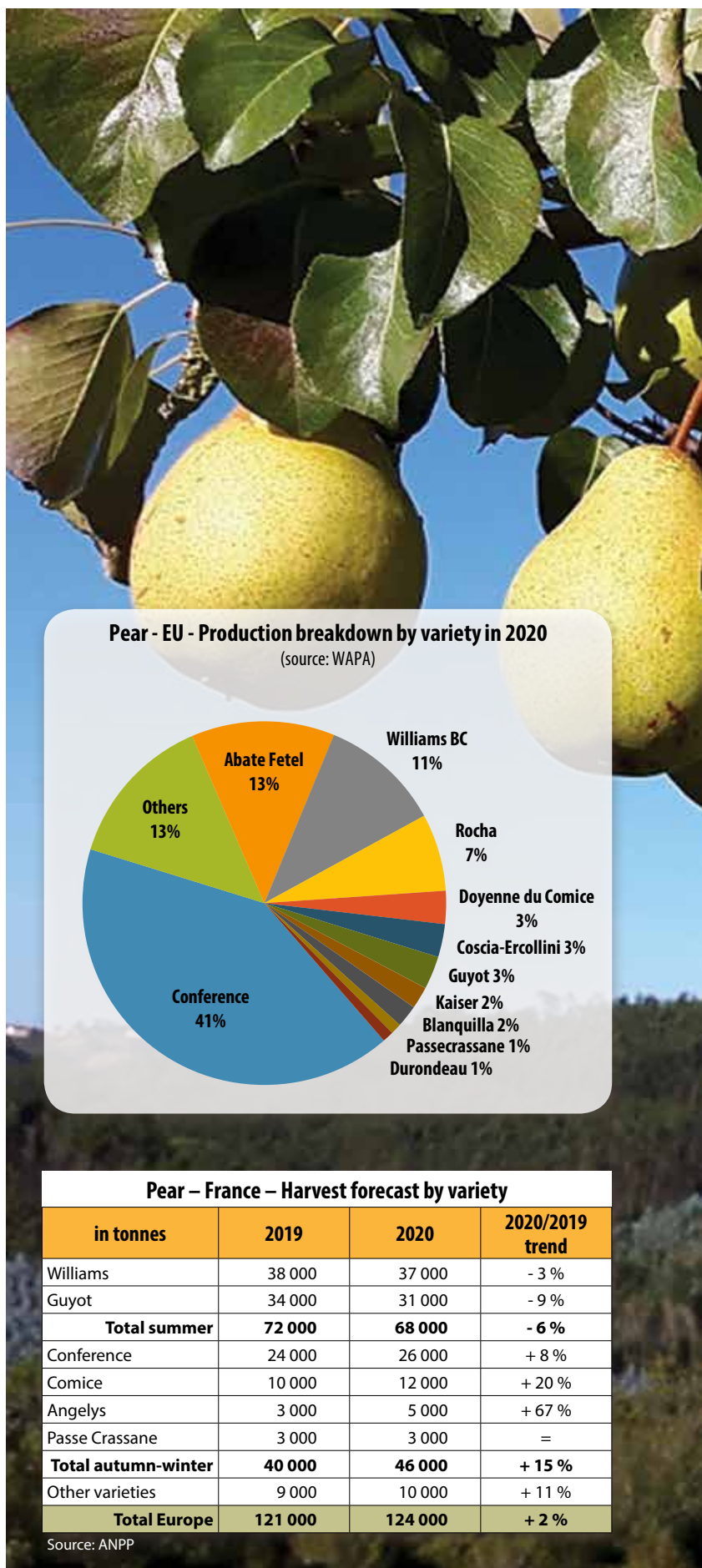
This year's estimated French harvest is 124 000 tonnes, volumes practically comparable to the previous campaign. Compared to 2019, we can see a shortage of Guyot for the summer pears, and a bigger harvest for the autumn-winter pears, because of large volumes of Conference and Comice. While the operators are not noting any difficulties for the coming campaign, there are still a few concerning factors to monitor, such as labour availability, and of course how the Covid pandemic develops, potentially causing unemployment, deflation on certain mass-produced products, lower purchasing power, etc. In addition, since lockdown, more serious questions are being raised over the preference given to purchases of local products, rejecting pre-packed products, etc. Operators say that they have entered a new commercial world since lockdown.

## One in two pears consumed in France is imported

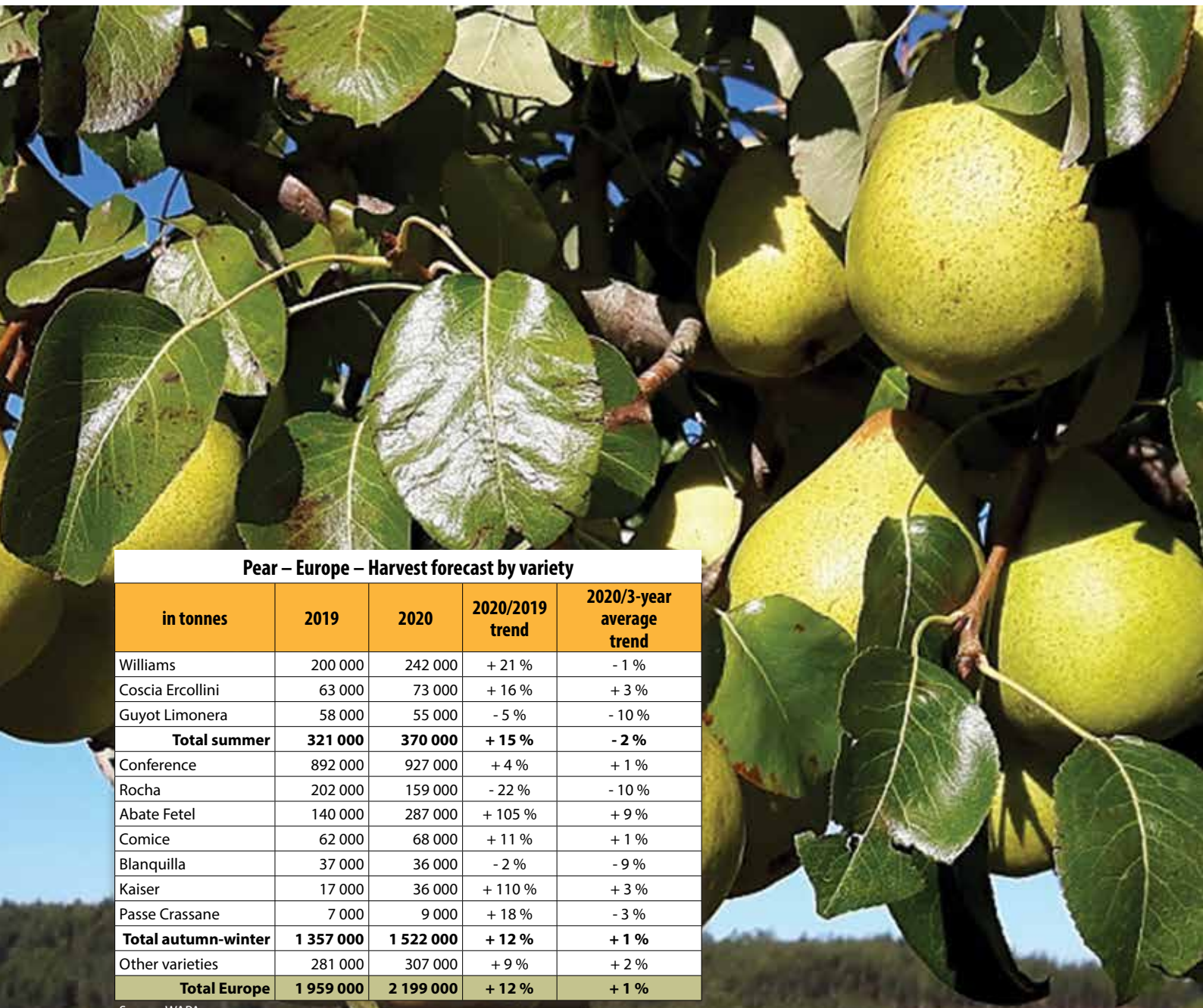
Consumers seem to have been rediscovering and enjoying this fruit over the past four or five years. Hence although French pear production is making a comeback, we have seen regained interest in this crop over the past three of four years. But this is not yet making itself felt in production potential, since the industry has had to cope with some climate incidents during flowering in spring.

France is not self-sufficient for the pear, with one in every two fruits imported. Yet the "eat local" movement, or at least "eat French", is encouraging producers to seize the opportunity to develop their orchards. In the face of this frenzy, there is a real fear this year of seeing many boxes of imported pears adopt French colours ■

**Anne-Solveig Aschehoug**, consultant  
annesolveig2@yahoo.fr







#### Pear – Europe – Harvest forecast by variety

in tonnes	2019	2020	2020/2019 trend	2020/3-year average trend
Williams	200 000	242 000	+ 21 %	- 1 %
Coscia Ercollini	63 000	73 000	+ 16 %	+ 3 %
Guyot Limonera	58 000	55 000	- 5 %	- 10 %
<b>Total summer</b>	<b>321 000</b>	<b>370 000</b>	<b>+ 15 %</b>	<b>- 2 %</b>
Conference	892 000	927 000	+ 4 %	+ 1 %
Rocha	202 000	159 000	- 22 %	- 10 %
Abate Fetel	140 000	287 000	+ 105 %	+ 9 %
Comice	62 000	68 000	+ 11 %	+ 1 %
Blanquilla	37 000	36 000	- 2 %	- 9 %
Kaiser	17 000	36 000	+ 110 %	+ 3 %
Passe Crassane	7 000	9 000	+ 18 %	- 3 %
<b>Total autumn-winter</b>	<b>1 357 000</b>	<b>1 522 000</b>	<b>+ 12 %</b>	<b>+ 1 %</b>
Other varieties	281 000	307 000	+ 9 %	+ 2 %
<b>Total Europe</b>	<b>1 959 000</b>	<b>2 199 000</b>	<b>+ 12 %</b>	<b>+ 1 %</b>

Source: WAPA

#### Pear – Europe – Harvest forecast by main producer countries

in tonnes	2016	2017	2018	2019	2020	2020/2019 trend	2016-2019 average	2020/average trend
Italy	681 000	738 000	730 000	363 000	642 000	+ 76.9 %	628 000	+ 2.2 %
Netherlands	374 000	330 000	402 000	373 000	373 000	0.0 %	369 750	+ 0.9 %
Belgium	322 000	310 000	369 000	332 000	362 000	+ 9.0 %	333 250	+ 8.6 %
Spain	311 000	331 000	298 000	313 000	300 000	- 4.2 %	313 250	- 4.2 %
Portugal	113 000	186 000	142 000	202 000	159 000	- 21.3 %	160 750	- 1.1 %
France	138 000	133 000	134 000	121 000	124 000	+ 2.5 %	131 500	- 5.7 %
Greece	47 000	59 000	60 000	58 000	66 000	+ 13.8 %	56 000	+ 17.9 %
Poland	55 000	40 000	70 000	70 000	65 000	- 7.1 %	58 750	+ 10.6 %
Germany	35 000	23 000	45 000	42 000	43 000	+ 2.4 %	36 250	+ 18.6 %
UK	24 000	23 000	23 000	20 000	18 000	- 10.0 %	22 500	- 20.0 %
<b>Total</b>	<b>2 171 000</b>	<b>2 237 000</b>	<b>2 358 000</b>	<b>1 959 000</b>	<b>2 199 000</b>	<b>+ 12.3 %</b>	<b>2 181 250</b>	<b>+ 0.8 %</b>

Source: WAPA



## Producer country file

# The banana in Mexico

by Noémie Cantrelle, Carolina Dawson and Thierry Lescot

The banana is a staple food in Mexico, with production aimed primarily at the local market. The banana sector, comprising a host of small growers, only developed into exports late on. They took off in the 2000s thanks to the very buoyant US market, which now represents nearly 75 % of shipments. Europe remains a marginal destination due to the origin's lack of competitiveness compared to its Latin American competitors. However, Mexico is exhibiting a desire to continue to diversify its outlets, especially to Asia. While exports seem to have reached a plateau at around 500 000 tonnes since 2017, the organic sector is continuing to make strong progress, mainly bound for the USA, where Mexico has become the number two organic banana supplier, within the space of a decade.

©Thierry Lescot



# THIS IS A GOOD GOOD GOOD BANANA



***GOOD for the environment, GOOD for producers and GOOD for consumers.***

Our SCB Premium bananas are also available in organic, Fairtrade and organic Fairtrade.

High quality fruit, produced under conditions respectful of people and the environment.





### History

Banana cultivation was introduced in Mexico in the late 19<sup>th</sup> Century in the State of Tabasco by Spanish missionaries. When the first multinationals started to take a keen interest in the banana throughout Latin America, production in Mexico stepped up significantly. However, unlike in neighbouring countries, the Mexican revolution (1910-1917), driven by a strong nationalistic ideology, prevented the big multinationals of the day from setting up on Mexican soil. The implementation of one of the first agricultural reforms in Latin America in 1915 proceeded in several stages, spread over a long period, during which land was redistributed to small growers. In the 1970s, with the implementation of the CONAFRUT programme, the State manifested its desire to boost export agriculture. However, the absence of State investment, and powerful bureaucracy, limited the development of the export banana sector. It was not until the 1990s that banana exports started to progress, aided by the signature of ALENA in 1993. From then on binational companies,

especially US-Mexican, started to appear, and invested in the production sector. In the most modest regions, such as in the centre of the country (Central Pacific production zone), these configurations were relatively limited. A fact of note is that the Cabal Group, belonging to the highly controversial banker Carlos Cabal Penacho, purchased Del Monte in 1994. Following the tax evasion and embezzlement scandals, he transferred the company to its current owners. From then on, the multinationals stayed away from the production fabric, reappearing only in the mid-2000s, in the form of long-term contracts (5 to 10 years) with the growers.

Exports, aimed mainly at the USA because of geographic proximity, only developed late on. Medium-sized growers were the first to initiate the movement. The majority of small growers had more difficulty accessing US phytosanitary certification, though the creation of growers' associations and their support made this somewhat easier.



© Thierry Lescot



*A COMOÉ a day,  
keeps the doctor away*

**Importer Distributor**

Sipef, Belgique  
Contact: [fruits@sipef.com](mailto:fruits@sipef.com)  
+ 32.3.641.97.37  
[www.sipef.com/bananas.html](http://www.sipef.com/bananas.html)

**Producer Exporter**

Plantation Eglin **GLOBALG.A.P.**  
Côte d'Ivoire

Comoé published by the Market News Service of CIRAD – All rights reserved





# Banana Mexico

## Location

Mexico has a rich and diverse planted area. Banana cultivation extended over more than 79 000 ha in 2019, based in the coastal zones (Gulf of Mexico, South Pacific and Central). Eight different banana varieties are cultivated, primarily intended for local consumption.

The development of Cavendish for export came later on. In 2019, cultivation of this variety covered approximately 36 603 ha, i.e. 46 % of the country's banana surface areas. The two main Cavendish production areas for export are situated in the south of the country: in Chiapas State in the South Pacific region (12 000 ha), the country's main production zone, and in Tabasco State in the Gulf of Mexico (8 536 ha). The wet tropical climate, alternating between a dry season (between 2 and 4 months) and rainy seasons, is favourable for banana cultivation. The rainfall is higher in Tabasco (1 700 to 3 500 mm) than in Chiapas (1 500 to 2 500 mm). The mean temperature in both these zones is 27°C. The soils are mainly alluvial and deep.

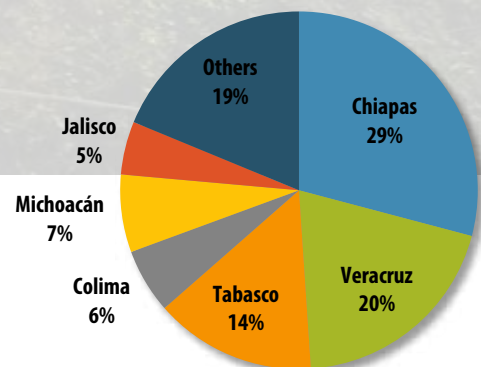
The other big Cavendish production area, which developed later, is situated on the Central Pacific coast in the States of Michoacán (4 128 ha), Colima (5 261 ha) and Jalisco (3 007 ha). Conversely, it is primarily the Colima zone which sends its fruit to the export markets, with fruit from Michoacán and Jalisco aimed mainly at the local market. On this coast, the climate is drier. The dry season lasts between 7 and 8 months, and average precipitation is only around 700 to 900 mm. So irrigation is essential. The average temperature is around 28°C. The soils are also alluvial and relatively deep. This pedoclimatic context is favourable for the development of organic cultivation. In Colima State, in 2019, SAGARPA recorded 1 433 ha in organic production. However, in view of the organic volumes exported in 2019, these official data seem under-estimated. The number should be closer to 2 000 ha, or even 2 600 ha.



# Banana Mexico

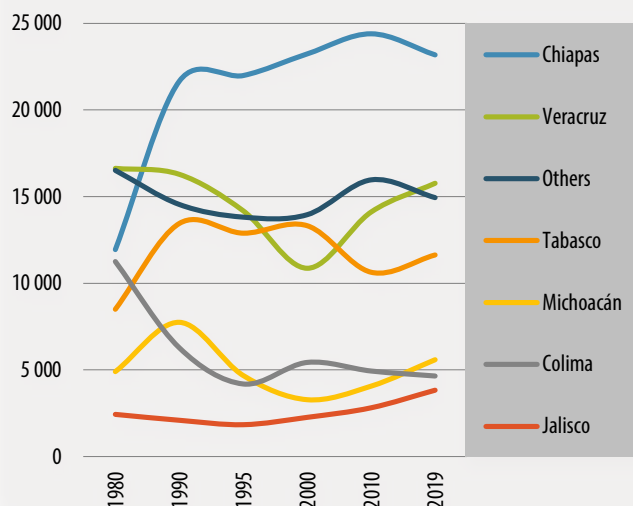


**Banana - Mexico - Breakdown of surface areas by state in 2019, all varieties**  
(\* Guerrero, Oaxaca, Puebla, Nayarit | source: SAGARPA)



**Banana - Mexico - Evolution of surface areas by state All varieties**

(\* Guerrero, Oaxaca, Puebla, Nayarit | in hectares | source: SAGARPA)



**Banana – Mexico – Census of cooking and dessert varieties cultivated in 2019**

Varieties	Sub-group
Macho	Plantain
Pera	Bluggoe
Manzano	Figue pomme
Criollo	Gros Michel
Dominico	Sucrier
Morado	Figue-rose
Valery	Cavendish
Cavendish/grande naine	Cavendish

Source: SAGARPA

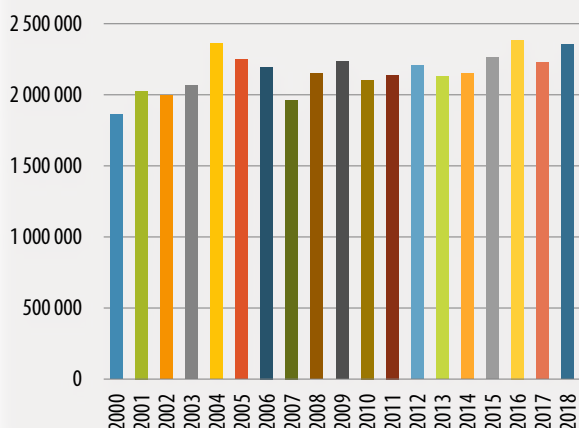


### Production

For the past two decades, the production dynamic has been rather stable, with volumes across all varieties fluctuating between 2 and 2.3 million tonnes, making Mexico as the world number 11 grower, according to the FAO. Local consumption is very strong, and is among the world's highest. Among the range of varieties available, the national population consumes mainly Cavendish and Platano Macho (plantain), and a bit of Dominico (silk banana). While the conventional Cavendish production dynamic for export seems to have plateaued out in recent years, especially because of stagnant economic returns, or even under export pressure, the prospect of the Chinese market opening up appears to have given the sector fresh impetus since 2019. Organic production is also continuing to climb (conversion in progress).

Mexican cropping practices are fairly conventional overall, with average yields of 35 t/ha, varying between 25 and 45 t/ha according to the production zones. The predominant planting system is known as "Marco Real", comprising a double or single row with an average density of between 1 500 and 2 000 plants/ha. The soil quality is mainly alluvial (along rivers), which is rather favourable for banana cultivation. Water requirements of course depend on the production zones, though the majority of tributary water flows down from a host of mountains and volcanoes. In irrigated areas (drier production zones), the micro-spraying system is favoured over drip irrigation, which is struggling to develop. Conventional production systems for the most part employ chemical weed management and fertilisation. Conversely, for organic agriculture, the banana plantations are weeded manually and mechanically. In some rare cases, use of covering plants and organic spreading is favoured.

**Banana - Mexico - Evolution of production**  
(in tonnes | source: FAO)



The diseases and pests present are:

- **Black Sigatoka**, which is attacking the whole country, though the infestation level remains moderate, unlike in other Latin American countries. However, numerous fairly regular treatments are applied in order to protect the canopy on a preventive basis. In drier production zones (Pacific coast except for Chiapas), the pressure is lower because of the lower rainfall;
- **Moko disease**, which is caused by a bacterium. It appeared in the 1990s, and is concentrated in a few locations, though without a major impact, as it is fairly well monitored and controlled;
- **red mites**, which may be more or less problematic according to production zones;
- **weevils** and **nematodes**, which are also present but have not posed a major threat so far.

For the moment, no TR4 (*Fusarium oxysporum*) outbreaks have been detected in Mexico.

Banana cultivation, which is highly labour-intensive, is partly carried out in the border areas (Tabasco and Chiapas) by immigrant Guatemalan labour. The banana industry generates more than 100 000 direct jobs, and more than 150 000 indirect jobs.





G.I.E

# FRUCTIFRUI

*Le groupement des Mûrisseurs*

DEPUIS 1987

- ✓ Responsible Sourcing
- ✓ Respect for values
- ✓ Renowned expertise
- ✓ Straightforward and Personal Business relationships

## ALL UNITED BY *INDEPENDENCE*

FRUCTIFRUI, France's third largest network of ripeners

### AGRUBAN

agruban94150@gmail.com

### FENES

fenesjose@orange.fr

### LLISO FRÈRES

contact@llisofreres.fr

### BANAGRUMES

direction@banagrumes.com

### FORTUNO

fortuno@fortuno.fr

### MURISSERIE D'ARMOR

murisserie.armor@orange.fr

### ETS BORDILS

bordils@wanadoo.fr

### GIL FRÈRES

gil-freres@wanadoo.fr

### RAFAEL LOPEZ

compta.rafaellopez@gmail.com

### SELECT AGRUMES

info@select-agrumes.com

### SELECT SERVICES

serge@select-agrumes.com



## Organisation

The various agricultural reforms implemented in the country caused a major fragmentation of the production fabric. The banana industry is now based on a few big agri-business groups, but above all nearly 5 000 small growers, who provide the bulk of production, and often grouped into growers' associations. These are present nationwide, and play an important role in technical and commercial support, and in acquiring certification. The biggest of them is the AAPPS (Asociación Agrícola de Productores de Plátano del Soconusco), which brings together growers from Chiapas, representing approximately 15 000 ha, and sending 50 % of their volumes for export. Note that unlike the majority of Central American growers, there is no multinational presence in the production sector.

## Players

The production sector is dominated by domestic small growers, alongside a few large groups consolidated since the 2000s.

- The **Cabal** group produces bananas under the "San Carlos" brand and "Bananas de Mexico" brand aimed at the international market. It is Mexico's biggest banana producer, with 2 600 more hectares in the States of Tabasco, Chiapas and Colima.
- The **Coliman** group, established in Colima State, was developed in the 1970s in other States (especially in Tapachula, Chiapas). Its bananas are sold under the "Amorita" brand. It was one of the organic pioneers in Mexico, and one of the first to obtain Fairtrade certification. It now has over 300 ha in organic cultivation.
- The **Bronco** group, situated in Tabasco State, currently possesses approximately 1 500 ha of banana plantations. Just 20 % of production is aimed at the export sector, with the rest sold locally. A large-scale project is ongoing, to increase production surface areas by 20 % per year for the export market.
- The **Frutas Tropicales Ibarra** group in the Colima zone is specialised in Cavendish production, with some organic production marketed under the "Rocio Bananas Organics" brand.
- The **Kavidac Produce**, group, which markets "Carmelita" brand bananas, possesses approximately 1 000 ha in production.
- The **Ramy** group, created in 1973, specialises in organic banana production.



Photos © Thierry Lescot



# *Ripe, you shall be!*

On the right side of the force our products are,  
as adhere to the ripening time we do.

Objective: **100 % customer satisfaction.**

[WWW.SOLYIMPORT.COM](http://WWW.SOLYIMPORT.COM)



PACKED  
WITH SATISFACTION



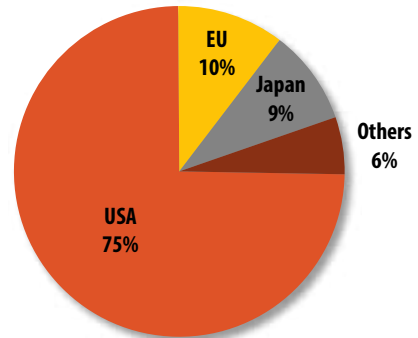
## Outlets

Local consumption remains the main outlet for Mexican banana production. Of the 2.4 million tonnes produced in 2019 across all varieties, only 544 000 tonnes were aimed at the export sector, i.e. 23 % of production. The domestic market appears capable of absorbing 50 to 80 % of Cavendish production, depending on the season. In terms of value, the export banana industry currently represents more than 250 million USD, i.e. approximately 1 % of Mexican agricultural GDP, which remains relatively low compared to other Mexican export fruits such as the avocado (2.4 billion USD) or the tomato (2 billion USD). Mexican exports, which had been gradually rising, made clear progress from 2013, triggered by the take-off of organic banana exports. From 2017, total exports reached a plateau of more than 500 000 tonnes per year.

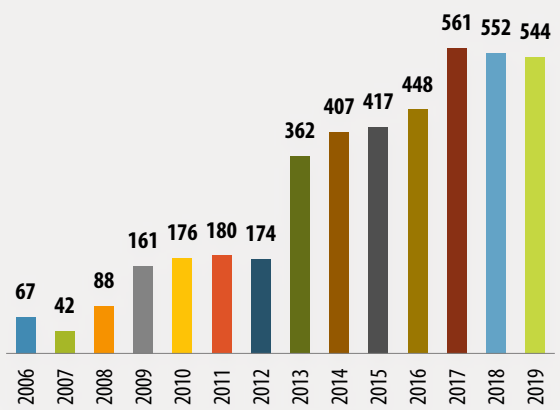
The USA, the main export outlet for Mexican bananas, accounts for 75 % of export volumes. Mexico is the number five supplier to this market behind Guatemala, Costa Rica, Ecuador and Honduras. It has significant assets due to the geographic proximity of the production zones, enabling the fruit to be transported in a matter of days, as well as a Customs duty exemption. Growth in exports to this market has particularly strengthened in recent years thanks to the rise in organic banana volumes (more than 90 000 tonnes). They increased practically five-fold in the space of six years, and now represent nearly 20 % of the total Mexican banana supply. In 2018, Mexico became the number two organic banana supplier to the US market, after Ecuador.

On the EU market, Mexican imports, after peaking at around 70 000 tonnes between 2014 and 2016, halved in the space of three years, falling back below 30 000 tonnes in 2019. This fall could be explained by a lack of competitiveness in the face of competing origins such as Ecuador, Peru or Guatemala, which enjoy decreasing Customs duty, reaching the base level of 75 euros/tonne in 2020. As Mexico is not part of the Association Agreement with the EU, Customs tariffs of 114 euros/tonne are applied above 2 000 tonnes of exports per year. Mexico's number three export market is Japan, with approximately 9 % of exports, i.e. more than 53 000 tonnes in 2019. Finally, Mexico has been able to export its bananas to China since March 2019, thanks to the culmination of a long negotiating process to ratify phytosanitary protocols. However, while the sector is excited about the prospects presented by the opening up of this market, exports have not yet made headway, the shortage of regular shipping lines and the long transport times remaining a major brake on shipping the fruit to Asia.

**Banana - Mexico - Exports by destination in 2019**  
(sources: Trademap, Eurostat, USDA )



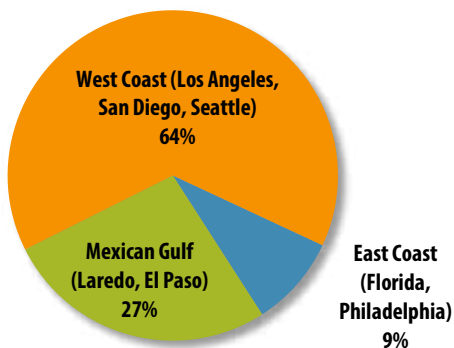
**Banana - Mexico - Exports all destinations**  
(in 000 tonnes | source: Trademap)



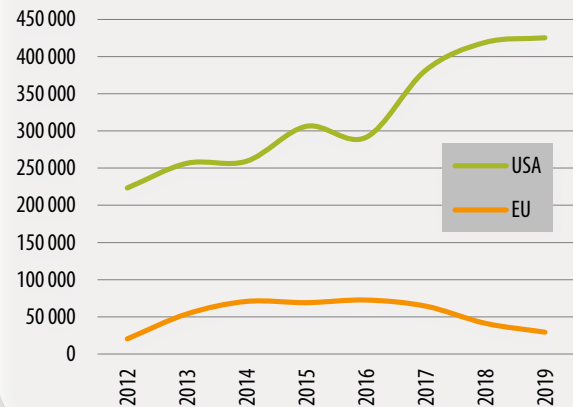
# Banana Mexico



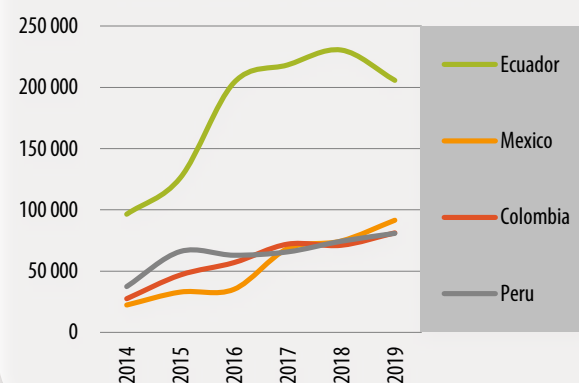
**Banana - Mexico - Entry points into the USA**  
(sources: FAS, USDA)



**Banana - Mexico - USA and EU imports**  
(in tonnes | sources: USDA, Eurostat)



**Organic banana - USA - Evolution of imports from main producer countries**  
(in tonnes | sources: US Customs, Cirad-FruiTrop)



## Logistics

While some of Mexico's export volumes to the USA are shipped by road-freight, the vast majority (i.e. 73 % of volumes) is transported by sea-freight, in 1 to 3 days. Two thirds of the volumes are aimed at the West Coast (mainly Los Angeles), and the rest is divided between the Gulf of Mexico zone, and to a lesser degree the East Coast (mainly Philadelphia). Note that 60 % of organic bananas are shipped to the Gulf of Mexico zone.

The main export ports on the Pacific Coast are the port of Manzanillo, which ships the fruit from Colima, and Puerto Madero, dedicated to produce from Chiapas. Since 2017, a regular line set up by Chiquita, with weekly departures, has provided a one-week link between Puerto Madero and Port Hueneme in Los Angeles. Prior to the recommissioning of Puerto Madero in the 2000s, bananas from Chiapas were shipped by road-freight to the Guatemalan ports of Puerto Barrios or Puerto Quetzal, and then to the USA. The port of Veracruz on the Atlantic Coast ships fruit from Tabasco State, and to a lesser degree, some produce from Veracruz State.

**Banana – Mexico – Sea freight**

Destination	Port of departure	Port of arrival	Transit time
United States	Manzanillo	Los Angeles	1 to 3 days
		Seattle	8 days
	Puerto Madero	Los Angeles	8 days
		Veracruz	Florida
Philadelphia	13 days		
European Union	Manzanillo (via the Panama canal)		21 to 23 days
	Veracruz		20 to 23 days
Japan	Manzanillo		13 to 15 days
China	Manzanillo		24 to 27 days



A report prepared by  
Eric Imbert

# Avocado

# Avocado

## Contents

- p. 42** World market – Review of summer 2019 and winter 2019-20 – Stable volumes, but market still exhibiting strong growth
- p. 48** Covid-19 – Impact varying between markets
- p. 60** Winter avocado campaign – New critical periods to be monitored in the EU-28?
- p. 62** Advance review of the summer 2020 avocado season on the EU market – A catastrophic scenario
- p. 64** Winter 2020-2021 forecasts for the European market – One more time?
- p. 84** Producer country file – The avocado in Chile
- p. 108** World Statistics
- p. 110** Main varieties
- p. 112** Post-harvest

© Régis Domergue



**THINK  
SUSTAINABLE  
PRACTICES**



**THINK  
PRODUCT  
INNOVATION**

**THINK  
YEAR-ROUND  
SUPPLY**



**THINK  
WESTFALIA FRUIT**



**THE LEADING  
#AVOEXPERTS**



# Avocado

## World market Review of summer 2019 and winter 2019-20

Stable volumes, but market still exhibiting strong growth

by **Eric Imbert**, CIRAD  
eric.imbert@cirad.fr

For the first time since the start of the decade, in 2019-20 the world avocado trade stagnated in volume terms, as opposed to an average growth of 200 000 tonnes per season. Does this point to the market hardening up? Certainly not! While the major over-supply crises to the EU-28 during summer 2018 and again this year are indeed alarming, the record for the winter season is quite the opposite. It was not demand which was lacking, but rather the supply, as is attested by the excellent price levels registered on the two main world markets. FruiTrop offers this review of the production context and an overview of the world's main markets.

© Catherine Sanchez

*Growers at heart!*

The best origins,  
experience and service



MEHADRIN INTERNATIONAL . 696 chemin du Barret, ZA du Barret  
13 160 Chateaurenard . France  
Tel. +33(0)4 32 60 62 90 . Fax. +33(0)4 90 24 82 54  
[benchadod@mehadrin-inter.com](mailto:benchadod@mehadrin-inter.com) . [www.mtex.co.il](http://www.mtex.co.il)

  
**mehadrin**  
Growers at heart

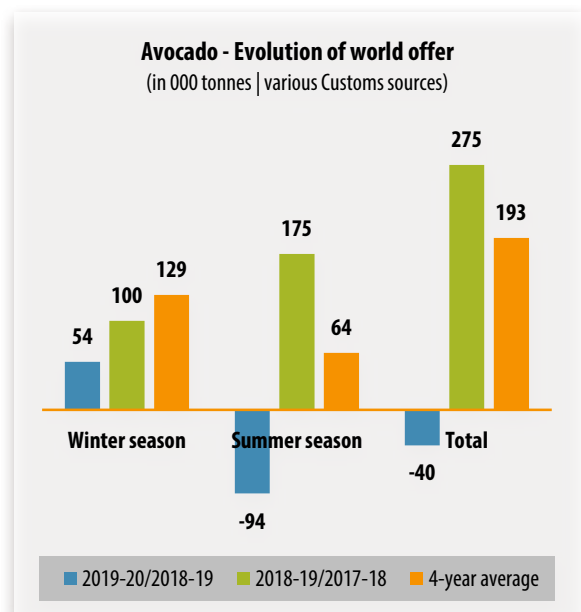
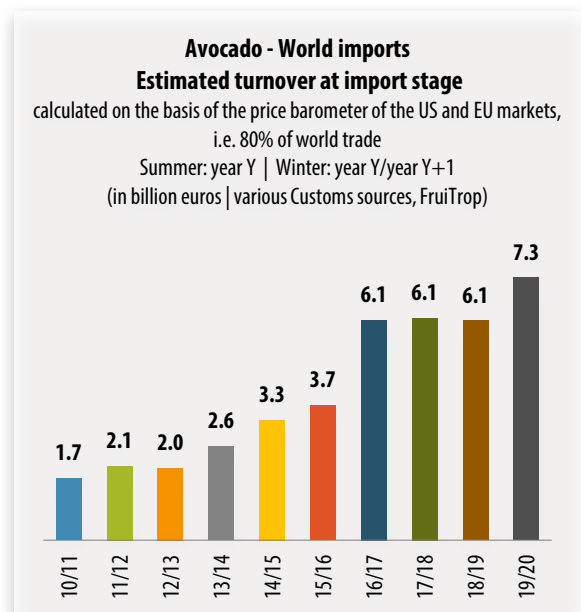
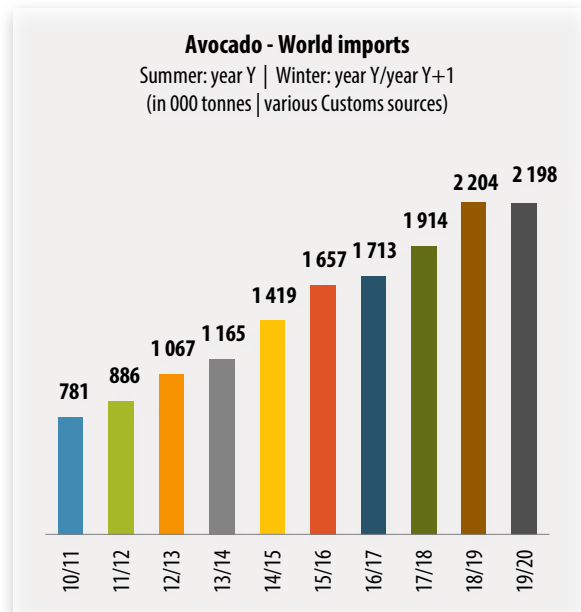


## Under-performance to be taken in context

We should take a step back to reach a fair analysis of the stagnation of the avocado trade at 2.2 million tonnes in 2019-20. The world market exhibited an impressive trajectory in 2018-19, with 300 000 tonnes' growth in a single season. Hence, smoothed over two seasons, the world trade dynamic remained strong (150 000 t per season, a level not so far off the 200 000 t average registered since the beginning of the decade). Furthermore, the economic figures were about as good as they could be. Our international trade barometer, calculated based on 80 % of world flows (US and EU-28 imports), and on the size 18 Hass import price (4-kg box), was up by 20 % from 2018-19 and 12 % above the four-year average. Meanwhile, turnover quite simply set a new record, at more than 7 billion euros! Hence the financial volume represented by world avocado imports has more than doubled in four years. The avocado is now close to the top three fruits by turnover, which are, in order of magnitude, the banana, grape and apple.

## Distinct supply shortfall during the summer season

The unprecedented under-performance of world trade was mainly due to a big fall in production from the supplier countries feeding the summer market (i.e., to put it crudely, the Southern Hemisphere countries excluding Chile). There was a major alternate bearing downswing, after an exceptional rise registered in the 2018 campaign. Exports dropped by nearly 100 000 t, after rising by 175 000 t between 2017 and 2018, and by a four-year average of 130 000 t. Peru was particularly hard hit, despite no less massive areas of young orchards entering production. There was also a marked fall by the other two leaders on this market, with a clearer downturn for South African than for Kenya.





# THE MISSION ADVANTAGE

TOTAL SUPPLY CHAIN AND QUALITY CONTROL

- Year-Round Supply
- Vertical Integration
- State-of-the-Art Avocado Specific Ripening





## Mixed production levels during the winter season

The context appeared fairly favourable for making up this shortfall during the winter season. The trade calendar was extended by approximately one month, with the summer season coming to an early end in mid-September. Furthermore, the number one, Mexico, which due to its size sets the tone for the trajectory of world production, enjoyed a historic harvest. Nonetheless, while there was a considerable rise in volumes sold during the winter season, it was not as marked as the context seemed to indicate, with a level actually well below average: “only” + 54 000 t, as opposed to nearly double that between 2017-18 and 2018-19, and a four-year average of 129 000 t. On the one hand, not all the supplier countries were in as comfortable a situation as Mexico in terms of production. Mediterranean harvests registered very mixed levels: modest to low in Israel and in Spain’s main production area; yet fairly high in Morocco and the new production zones on the Iberian Peninsula. Similarly, Chile saw a below-average harvest, while Colombia had another considerable rise.

## Covid pandemic impact on certain markets

Furthermore, the consequences of the Covid-19 pandemic must not be passed over. The OOH sector shrivelled up on all the world’s main markets at the height of lockdown (between February and April 2020, according to the regions). It remains sluggish in plenty of countries. Despite the sometimes spectacular rises in retail sales, they were seldom able to offset the collapse of this segment (see inset).



# Avocado World Market

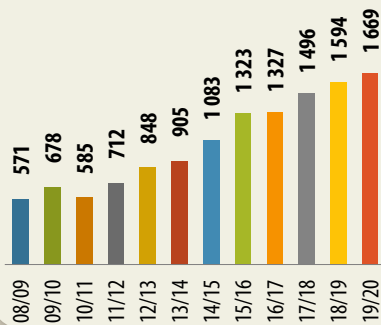
## Main suppliers

### export dynamic

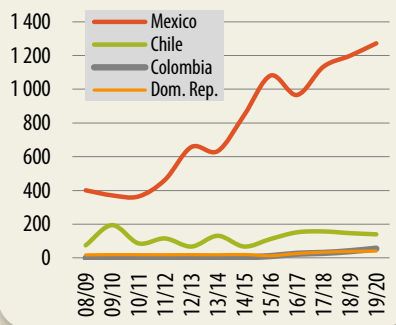
**WINTER SEASON: 1 669 000 tonnes – 79 % of world market**

Export calendar mainly centred on autumn and winter

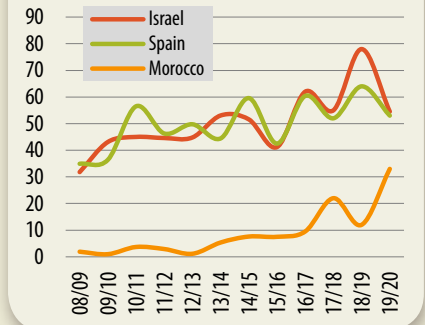
**Avocado - World export in winter season**  
(in 000 tonnes | professional sources)



**Avocado - Latin America exports in winter season**  
(in 000 tonnes | professional sources)



**Avocado - Mediterranean exports in winter season**  
(in 000 tonnes | professional sources)



**Avocado – World – Exports**

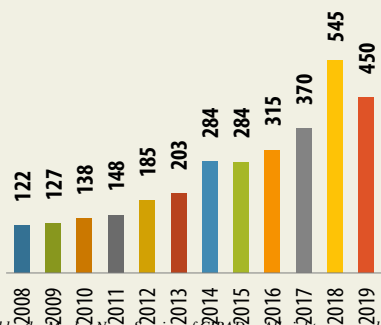
in 000 tonnes	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
<b>Total</b>	<b>624</b>	<b>693</b>	<b>805</b>	<b>724</b>	<b>860</b>	<b>1 033</b>	<b>1 108</b>	<b>1 367</b>	<b>1 607</b>	<b>1 642</b>	<b>1 866</b>	<b>2 139</b>	<b>2 118</b>
<b>Total winter season, incl.</b>	<b>526</b>	<b>571</b>	<b>678</b>	<b>585</b>	<b>712</b>	<b>848</b>	<b>905</b>	<b>1 083</b>	<b>1 323</b>	<b>1 327</b>	<b>1 496</b>	<b>1 594</b>	<b>1 669</b>
<b>Latin America</b>	<b>442.6</b>	<b>494.2</b>	<b>585.2</b>	<b>470.5</b>	<b>597.7</b>	<b>745.2</b>	<b>784.8</b>	<b>939.6</b>	<b>1 217.6</b>	<b>1 169.3</b>	<b>1 354.7</b>	<b>1 424.0</b>	<b>1 508.0</b>
Mexico	308.4	401.0	370.9	364.5	462.7	657.4	633	847	1 081	966	1 134	1 198	1 272
Chile	113.7	74.9	194.4	86.4	115.7	67.5	131.3	67.6	112.5	152.0	157	147	140.0
Dominican Rep.	20.5	18.3	19.8	19.5	19.2	19.8	18.9	20.4	13.2	26.3	34	39	41.0
Colombia	0.0	0.0	0.1	0.1	0.0	0.5	1.2	4.5	10.9	25.0	30.0	40.0	55.0
<b>Mediterranean</b>	<b>68.4</b>	<b>68.6</b>	<b>80.5</b>	<b>105.2</b>	<b>93.8</b>	<b>95.7</b>	<b>102.9</b>	<b>118.8</b>	<b>91.2</b>	<b>131.9</b>	<b>129.0</b>	<b>154.0</b>	<b>140.5</b>
Spain	39.4	34.9	36.4	56.5	46.3	49.8	44.4	59.6	42.5	60.4	52	64	53.0
Israel	27.3	31.8	43.1	45.0	44.6	44.8	53.1	51.6	41.2	62.0	55	78	54.5
Morocco	1.7	1.9	1.0	3.7	2.9	1.1	5.4	7.6	7.5	9.5	22	12	33
<b>New Zealand</b>	<b>14.5</b>	<b>7.7</b>	<b>12.4</b>	<b>9.6</b>	<b>20.4</b>	<b>6.7</b>	<b>17.3</b>	<b>24.7</b>	<b>14.0</b>	<b>26.0</b>	<b>12</b>	<b>16</b>	<b>20.0</b>
<b>Total summer season, incl.</b>	<b>99</b>	<b>122</b>	<b>127</b>	<b>138</b>	<b>148</b>	<b>185</b>	<b>203</b>	<b>284</b>	<b>284</b>	<b>315</b>	<b>370</b>	<b>545</b>	<b>450</b>
<b>Latin America</b>	<b>39.1</b>	<b>53.1</b>	<b>51.3</b>	<b>62.2</b>	<b>84.7</b>	<b>87.8</b>	<b>118.9</b>	<b>184.9</b>	<b>178.9</b>	<b>199.1</b>	<b>253.8</b>	<b>368.6</b>	<b>320.8</b>
Peru	37.6	51.3	48.3	59.5	81.4	83.6	114.5	179.0	174.3	194.1	246.0	361.0	310.5
Brazil	1.5	1.8	2.9	2.7	3.3	4.3	4.3	5.8	4.6	5.0	7.8	7.6	10.3
<b>Africa</b>	<b>53.3</b>	<b>66.9</b>	<b>57.8</b>	<b>68.0</b>	<b>49.7</b>	<b>74.7</b>	<b>72.4</b>	<b>91.0</b>	<b>92.3</b>	<b>107.9</b>	<b>98.9</b>	<b>168.4</b>	<b>115.9</b>
South Africa	37.6	51.2	38.8	47.8	27.6	50.3	46.4	60.2	50.1	57.4	43.0	89.0	47.9
Kenya	15.7	15.7	19.1	20.2	22.0	23.8	25.0	28.9	38.9	46.7	51.5	71.9	60.0
Tanzania			0.0	0.0	0.1	0.6	1.0	1.9	3.3	3.8	4.4	7.5	8.0
<b>California</b>	<b>6.1</b>	<b>2.4</b>	<b>17.4</b>	<b>8.1</b>	<b>13.9</b>	<b>22.5</b>	<b>11.5</b>	<b>8.4</b>	<b>12.8</b>	<b>8.0</b>	<b>17.0</b>	<b>7.8</b>	<b>13.0</b>

Source: Customs

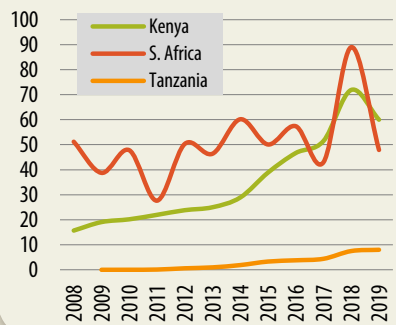
**SUMMER SEASON: 450 000 tonnes – 21 % of world market**

Export calendar mainly centred on spring and summer

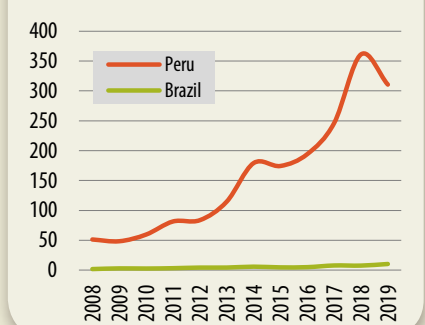
**Avocado - World export in summer season**  
(in 000 tonnes | professional sources)



**Avocado - Africa exports in summer season**  
(in 000 tonnes | professional sources)



**Avocado - Latin America exports in summer season**  
(in 000 tonnes | professional sources)







## Covid-19

### Impact varying between markets

How to measure the effect of the Covid-19 pandemic on world trade during this disrupted season? It is important to clarify this point, as the epidemic seems intent on a prolonged stay, or even to embark on a more intense second wave. Unfortunately, the finest analysis tools, namely consumption data, are lacking and/or fail to take into account the OOH segment, which represents a major outlet on certain markets. The supply and price trends shed some light, albeit not entirely clearly. The effects seem to have varied between the markets.

#### USA weighed down by the fall in OOH segment activity

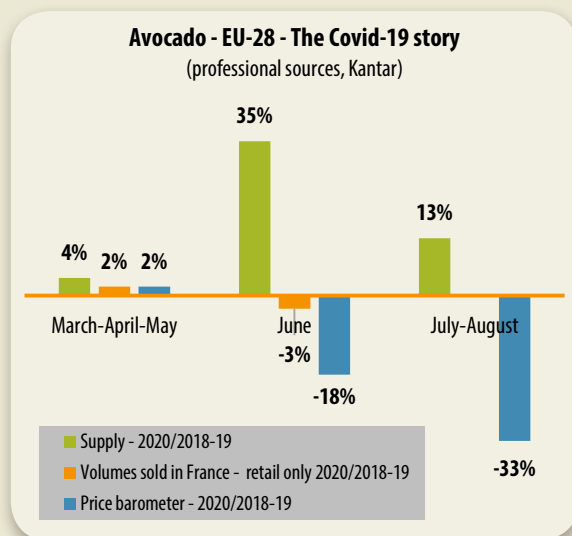
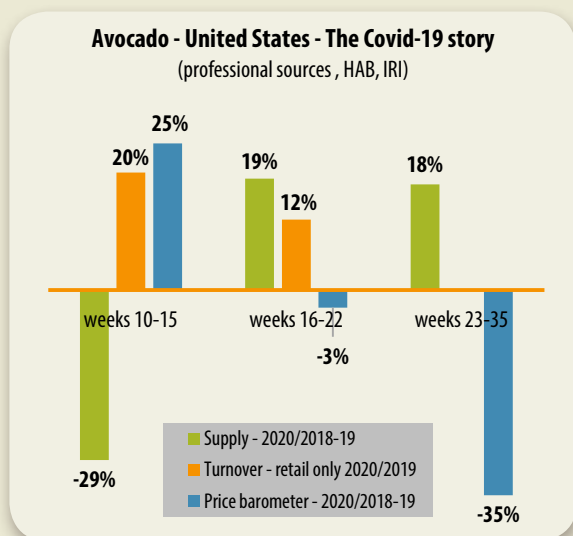
In the USA, the supply collapsed at the start of the crisis, from early March to mid-April (- 30 % from week 10 to week 15, according to the HAB's figures). The industry turnover (source: IRI panel), which only reports retail sales, went up by approximately 20 % during these same weeks, which seems to indicate that during this period this sales channel was doing very good business. Nonetheless, this rise probably did not offset the collapse in sales via the OOH segment, which in normal times would take in approximately 30 % of volumes, according to professionals. Thereafter, the return to a bigger supply volume from mid-April tipped prices toward a distinctly below-average level, after a lag; and they would remain stuck at this level throughout the summer. Operators had to step up the retail promotions, not only to cope with the recurrent lack of activity from the OOH segment, but also to cope with overall volumes

much bigger than in previous years. So the Covid-19 effect only partly explains the low prices charged in the USA since June.

#### Retail trade in the EU-28 holding up

The EU-28 seems to have held up better, if we adopt an analysis cut-off point at the end of May, after which the supply volume became so huge that it was clearly the major cause of the market collapse (see review). The figures from the consumption panels, available only for France and Germany, confirm that volumes sold via retail held up well over the period from March to May (+ 2 % in Germany, and - 3 % in France). Throughout this period, our price barometer registered a good level in parallel, more than 15 % higher than in 2019, and equivalent to the four-year average. So operators did not need to resort to massive promotions to sell off the available volumes.

This summary analysis, conducted with the means at hand, seems to show that the US market was more fragile than the European market during this pandemic period, a factor of course to be put into perspective given the weight of the OOH segment (two or three times bigger). Until sales to this outlet regain cruising speed, the US market supply will require particularly fine management, and with numerous promotions, in order to prevent an over-supply, the possible consequences of which could lead to volumes spilling onto the EC market.

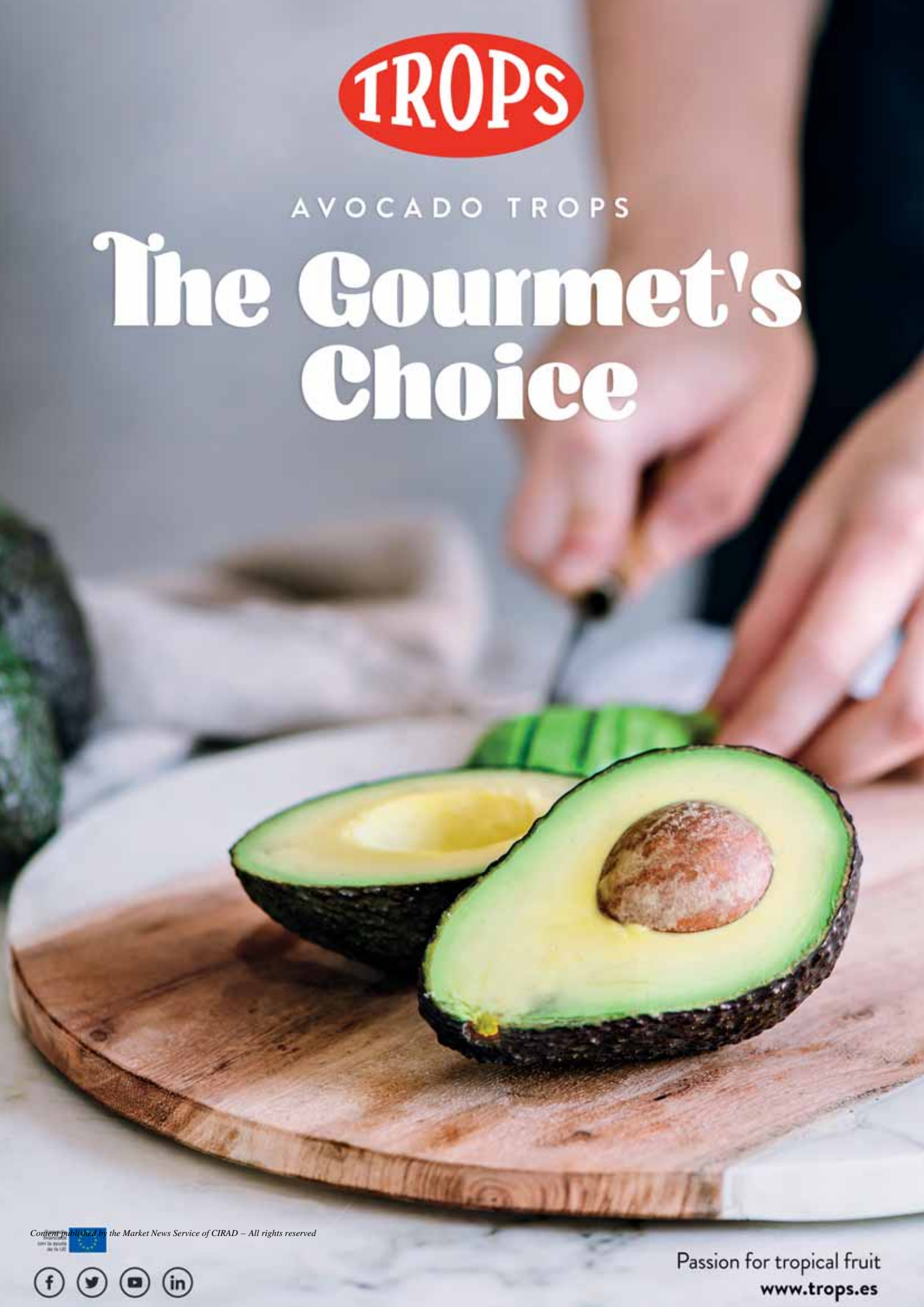


The logo for Trops, featuring the word "Trops" in a white, bold, sans-serif font inside a red oval.

**Trops**

AVOCADO TROPS

# The Gourmet's Choice



Content published by the Market News Service of CIRAD – All rights reserved



Passion for tropical fruit  
[www.trops.es](http://www.trops.es)

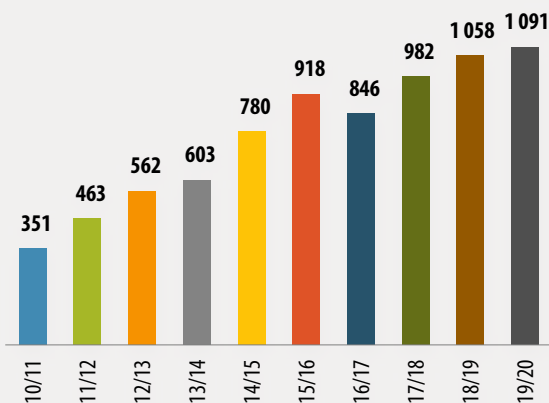




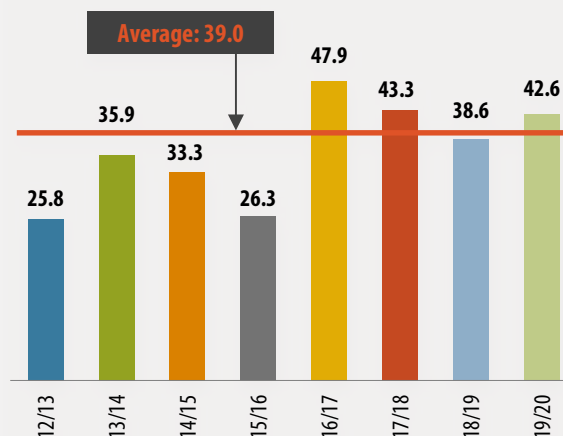
## A slight rise on the world's number one market

US imports rose by approximately 30 000 t during the period from July 2019 to June 2020, to approach 1.1 million tonnes: although the gourmets might say “only”... It is true that we have got used to much more dazzling performances from this country in recent seasons (+ 70 000 t on average). Furthermore, the context appeared favourable, with a small Californian harvest paving the way for imports and a very good production level from Michoacán, the main supplier to this market. In a similar context in 2017-18, imports had risen by approximately 140 000 t. Does this point to US demand for one of their favourite fruits slackening off? No – rather, it can be attributed to a few months where volumes sold bring limited by a shortage of fruit (early July, with the Mexican season starting gradually), or above all because of the disruptions due to the pandemic which affected both the upstream and downstream segments, in particular from early March to mid-April (see inset). As proof, our campaign average price indicator registered a level 10 % above the four-year average. It exhibited metronomic regularity, fluctuating from early September to mid-February within a narrow range of 30 to 40 USD per lug, before seeing a slight surge in the peak period of the pandemic in late winter/early spring.

**Avocado - United States - Imports**  
July to June, excluding Peru (calendar year)  
(in 000 tonnes | source: US Customs)



**Avocado - United States - Average price indicator**  
(in USD/11.14-kg lug | source: USDA)



### Avocado – United States – Supply

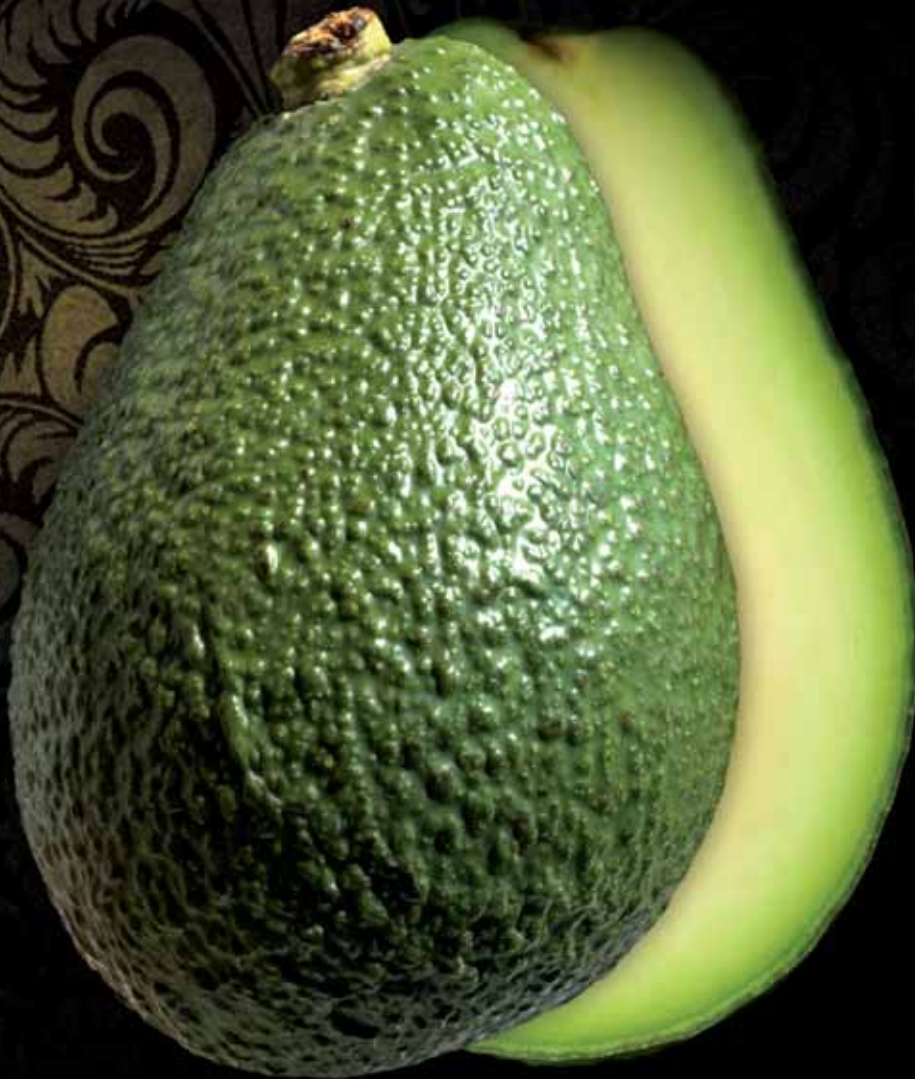
in tonnes	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Total</b>	<b>351 120</b>	<b>462 777</b>	<b>561 892</b>	<b>603 160</b>	<b>780 412</b>	<b>917 667</b>	<b>846 414</b>	<b>982 227</b>	<b>1 058 084</b>	<b>1 090 704</b>
Mexico	281 672	360 924	515 143	512 276	686 404	853 617	764 680	862 596	917 730	963 539
Peru	137	9 157	15 860	21 617	64 448	46 284	31 573	64 420	81 893	85 174
Dom. Rep.	14 956	17 204	16 150	15 958	15 548	7 393	20 805	25 757	29 560	27 823
Chile	54 355	74 701	14 721	53 305	10 600	10 362	29 354	29 454	28 001	12 216
Colombia	-	-	-	-	-	-	-	-	889	1 951
Others	-	791	18	4	3 412	11	2	-	19	1

Source: US Customs

# Avocado at its best

**" Year round supplies of the finest  
varieties from the best sources in the world "**

Gabriel Burunat.



**Let's all respond to consumer expectations  
and increase sales by supplying ripe fruits!**



[www.commercial-fruits.com](http://www.commercial-fruits.com)

31, Avenue de l'Europe - Zone des Entrepôts - Bât. I 9  
BP 70122 - 94538 Rungis Cedex - FRANCE  
Tel +33 (0)1 46 87 30 00 - Fax : +33 (0)1 45 12 96 74  
[gabriel.burunat@commercial-fruits.com](mailto:gabriel.burunat@commercial-fruits.com)



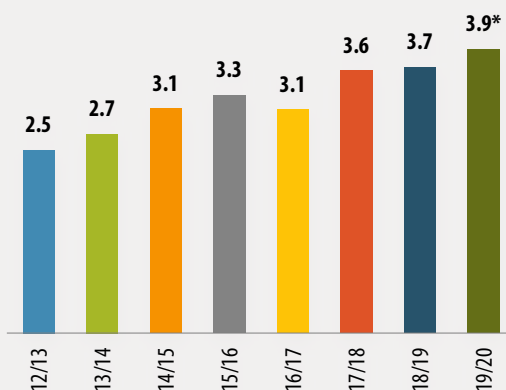


## US demand for avocado as keen as ever

Sales in Q4 2019, the only period of this campaign when there was a large supply of Mexican fruit available, and when the market was not yet affected by the pandemic, gave a true indication of the health of demand in the USA... and the news was good! Sales grew by 7 % from 2018 during this period, which was accompanied by a limited drop in prices of approximately 4 %. The dynamic came mainly from the under-consuming regions of the East Coast (South-East and North-East), but also the West, already very much a super-consumer. California, although top of the charts across all categories in terms of volumes taken in per capita, also exhibited a fine rise, of a level close to the national average. The Plains and Mid-South regions, conversely, stagnated. The net bag market segment remained a powerful growth driver. According to the HAB's figures, it was up by 20 % by volume, and by more than 30 % by turnover, between 2018 and 2019, after an increase of more than 55 % by volume and nearly 30 % by value between 2017 and 2018. This segment represented 45 % of volumes sold in 2019. Its rise nibbled into the share of small fruit (US size 60, i.e. 22 in 4-kg box equivalent) and large fruit (US size 40, i.e. 14 in 4-kg equivalent), which fell by 10 to 15 %, though they still each represented approximately 25 % of the market.

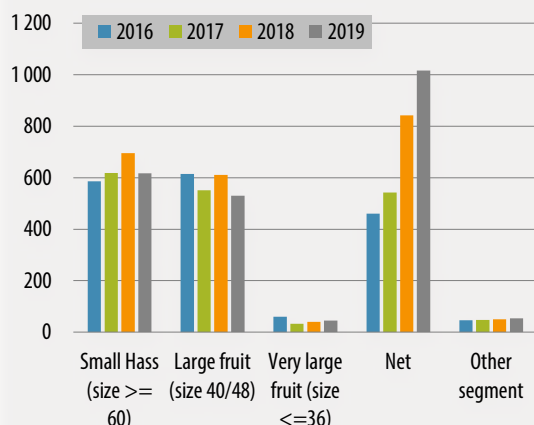
### Avocado - United States - Consumption

(\* estimate | in kg/capita | sources: Customs, CAC)



### Avocado - United States - Sales by market segment

(in million units | source: HAB)

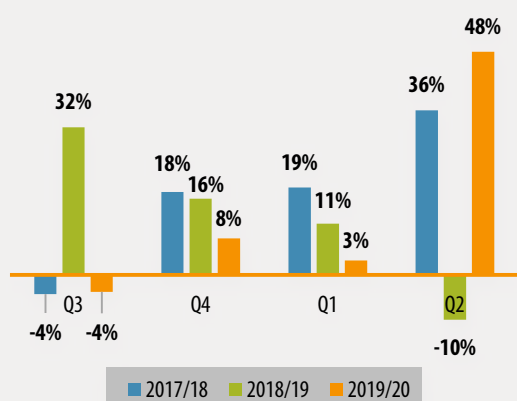


## Mexico increasing its stranglehold on the US market

In terms of suppliers, Michoacán appears to be increasingly in control during the winter season; leaving little room for Chile, whose already minimal market share tumbled by approximately 3 %, to barely over 1 %. Colombia maintained a nominal presence (barely 2 000 t received), with the sanitary protocol remaining highly restrictive despite easing in 2019. Only Peru managed to withstand the Mexican steamroller, thanks to less frontal competition during the summer season.

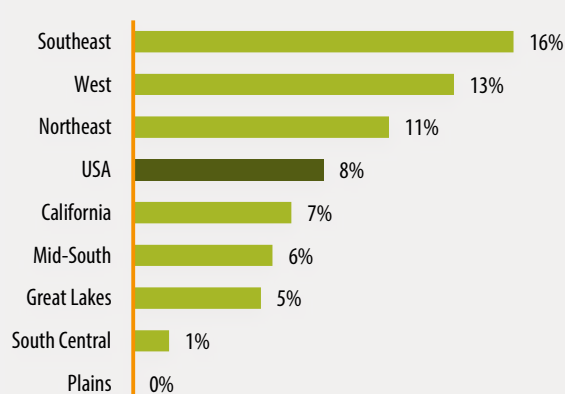
### Avocado - United States - Evolution of retail quarter sales

(year Y/Y-1 | source: HAB)



### Avocado - United States - Evolution of consumption 2019/2018

(Q4 2019 | source: HAB)







**PROVIDING  
AVOCADOS TO THE  
WHOLE WORLD**

**mevi**

**AVOCADOS IN EVERY WAY,  
FOR EVERY DAY**



[meviavocados.com](http://meviavocados.com)

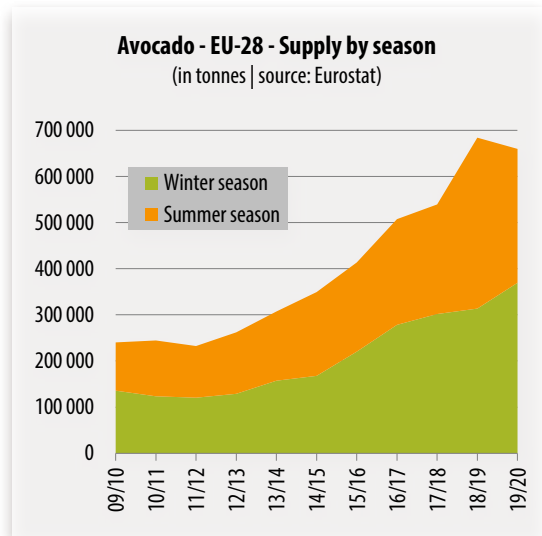
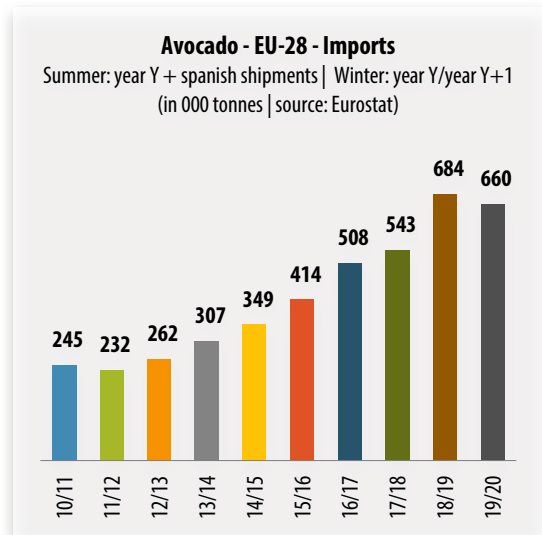




© Guy Brehner

## An unprecedented downturn for the EC market

The EC market recorded an unprecedented under-performance. Volumes imported from extra-EC suppliers or from the Iberian Peninsula, growing at a tempo often exceeding US imports in recent seasons, slipped down in 2019-20 to reach approximately 660 000 t. Just as on the other side of the Atlantic, the fall was mainly due to a lack of supply. The summer 2019 season brought a major alternate bearing downswing, after the bumper harvests of the 2018 season. All the players on this market saw their exportable potential collapse, in particular the big two, with a downturn in exports to the EU-28 of nearly 45 000 t for Peru, and more than 30 000 t for South Africa. The winter 2019-20 season brought a completely different trend, with an extra four weeks or so of trading due to the early end of the summer season. The supply leapt up by more than 50 000 t. Mexico, Morocco and Colombia were the main architects of this increase, illustrating the very rapidly expanding cultivation areas in these countries.



### Avocado – European Union – Supply

in tonnes	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Total</b>	<b>232 436</b>	<b>262 115</b>	<b>307 358</b>	<b>349 426</b>	<b>413 717</b>	<b>507 582</b>	<b>542 653</b>	<b>684 252</b>	<b>659 920</b>
<b>Total N. Hemisphere, incl.</b>	<b>120 414</b>	<b>128 824</b>	<b>157 266</b>	<b>167 741</b>	<b>220 318</b>	<b>278 351</b>	<b>305 045</b>	<b>313 643</b>	<b>369 588</b>
Chile	32 637	41 074	62 968	42 797	78 244	90 138	92 467	87 571	95 210
Mexico	2 909	9 085	6 293	12 918	45 593	36 884	60 993	47 561	71 645
Spain	38 900	38 500	36 700	50 600	37 700	55 200	48 600	57 000	57 100
Colombia	121	486	1 142	3 740	11 189	24 024	29 752	38 000	54 700
Israel	40 448	35 175	42 844	46 086	34 995	56 600	41 567	60 101	43 465
Morocco	2 803	840	4 766	7 798	7 115	9 552	21 746	11 237	32 649
Dominican Rep.	1 467	2 503	1 810	3 034	4 445	5 527	7 345	8 657	11 482
Portugal	-	-	-	-	-	-	1 440	3 032	2 753
Others	1 129	1 161	743	768	1 037	426	1 135	484	3 020
<b>Total S. Hemisphere, incl.</b>	<b>112 021</b>	<b>133 291</b>	<b>150 092</b>	<b>181 686</b>	<b>193 399</b>	<b>229 231</b>	<b>237 608</b>	<b>370 609</b>	<b>290 332</b>
Peru	66 155	62 618	86 260	101 971	114 321	144 367	157 744	228 769	184 109
Southern Africa*	27 375	49 083	45 165	56 713	50 962	54 095	43 984	87 127	54 948
Kenya	15 028	17 078	13 313	15 604	20 728	23 444	25 425	41 525	35 530
Brazil	3 006	3 959	3 928	5 265	3 535	3 908	7 189	6 680	8 158
Tanzania	6	133	968	1 643	3 278	2 948	2 987	6 244	6 612
Mozambique	-	-	-	-	-	-	56	168	975
Others	451	420	458	490	575	470	224	96	36

\* South Africa, Zimbabwe, Swaziland | Source: Eurostat

Content published by the Market News Service of CIRAD – All rights reserved



## Profit from the know-how of the European leader in ripening

Take advantage – all year long – of our ready-to-eat avocados from around the world.

The great variety of origins and brands offered by Greenyard Fresh France for your supply in avocados makes it possible to satisfy the request and the segmentation of your clientele all year round.



**Greenyard Fresh France SAS**

15, boulevard du Delta / Zone Euro Delta DE1 / 94658 Rungis Cedex / France

T +33 1 49 78 20 00 / F +33 1 46 87 16 45 / [contact@greenyardfresh.fr](mailto:contact@greenyardfresh.fr)

[www.greenyardfresh.fr](http://www.greenyardfresh.fr)

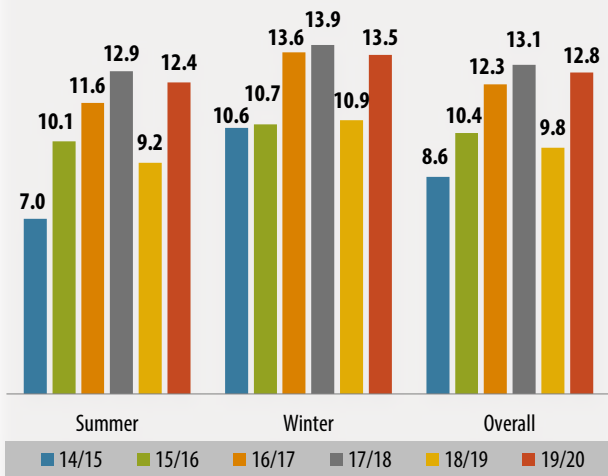
Content published by the Market News Service of CIRAD – All rights reserved

*for a healthier future*



### Avocado - EU-28 - Average campaign price indicator

Last summer season: 2019  
(in euro/4-kg box | source: CIRAD)



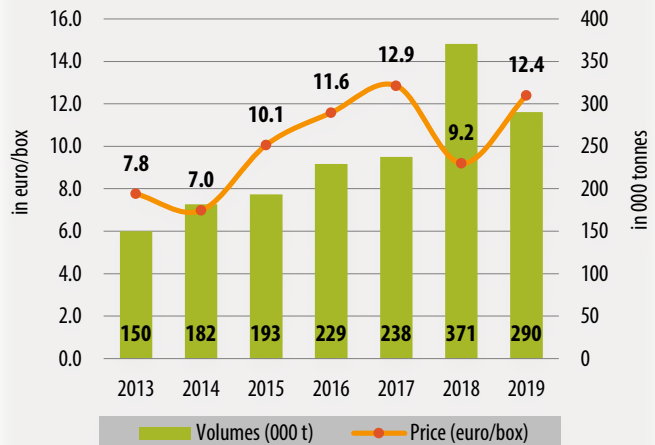
## Campaign average price close to the 2017-18 record

Unsurprisingly, in a nondescript supply context, our campaign average price indicator (focused on size 18) registered a rise of 30 % from the 2018-19 season, close to the absolute record from 2017-18 (with nearly an additional 100 000 t sold). The surge in average price which occurred during summer 2019 will come as no surprise to anyone, given the paucity of volumes available (indicator at 12.40 euros/4-kg box, close to the 2017 record). This counter-season campaign went practically without a hitch, with the usual dip in late May marked but short-lived. The record performance registered during the winter season was more astounding at first sight: price and volumes registered a two-digit rise, of 30 % and 20 % respectively! This goes to show the spectacular dynamic of the EC market, in what was nonetheless a highly favourable context of a short summer campaign, which provided an additional month's trading and enabled exceptional price footings at the start. Nonetheless, the campaign was far from easy (see inset).



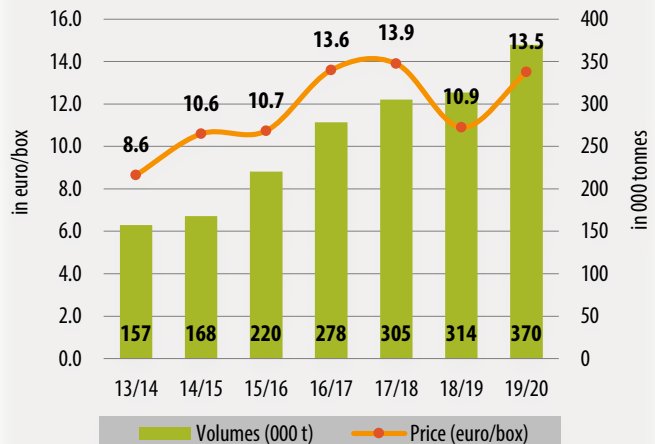
### Avocado - EU-28 - Supply and average price in summer season

(sources: Eurostat, CIRAD)



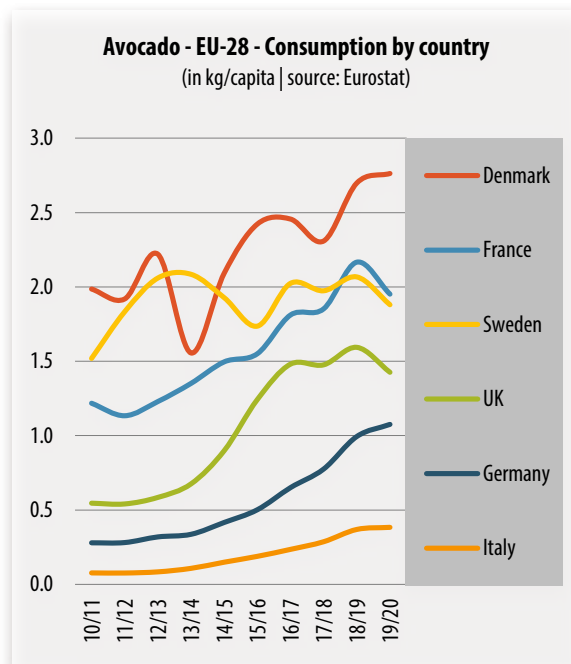
### Avocado - EU-28 - Supply and average price in winter season

(sources: Eurostat, CIRAD)



## Germany still just as dynamic

It is tough in this context of a slight supply drop to assess the health of demand on the various EC markets. Nonetheless, some figures should be highlighted. The top two, namely France and the United Kingdom, under-performed, with their consumption down by considerably more than the European average. While there had been a perceptible slowdown in the UK's growth dynamic for the past few seasons, the downturn registered in France was completely unprecedented, bringing an end to a decade of constant strong growth. Conversely, the other figure to bear in mind is the continuing surge by the German and Austrian markets. Growth remained strong (+ 8 % and + 6 % respectively), despite the context of volume shortages. Italy too had a notable rise, more modest yet nonetheless considerable (+ 4 %), confirming the awakening of this high-potential market though still very under-consuming in view of its large population. The Scandinavian market confirmed its stabilising trend – albeit a deceptive stability, due to Sweden's downturn being offset by slight but recurrent growth by Norway and Denmark – and led the way more than ever in Europe in consumption, with 2.6 to 2.8 kg/capita.



### Avocado — Consumption in Europe (June 2019 to May 2020)

	Estimated marketed volume in 2019-20 (t)*	Population in millions	Consumption per capita (g)	2019-20 compared to	
				2018-19	2015-16
<b>EU-28 + Norway + Switzerland</b>	<b>609 236</b>	<b>524.9</b>	<b>1 161</b>	<b>- 2 %</b>	<b>+ 73 %</b>
<b>EU-15 + Norway</b>	<b>546 914</b>	<b>413.7</b>	<b>1 322</b>	<b>- 2 %</b>	<b>+ 47 %</b>
France	130 797	66.9	1 955	- 10 %	+ 27 %
United Kingdom	95 054	66.3	1 434	- 10 %	+ 18 %
Germany	89 315	82.8	1 079	+ 8 %	+ 119 %
<b>Scandinavia</b>	<b>57 074</b>	<b>26.7</b>	<b>2 138</b>	<b>- 1 %</b>	<b>+ 13 %</b>
Sweden	19 237	10.1	1 905	- 8 %	+ 14 %
Denmark	16 042	5.8	2 766	+ 3 %	+ 17 %
Norway (non-EU)	13 922	5.3	2 627	+ 4 %	+ 12 %
Finland	7 873	5.5	1 431	0 %	+ 3 %
Spain**	67 500	46.7	1 445	+ 1 %	+ 19 %
Netherlands**	40 000	17.2	2 326	0 %	+ 48 %
Italy	23 147	60.5	383	+ 4 %	+ 102 %
Belgium	7 655	11.4	671	0 %	+ 85 %
Austria	9 785	8.8	1 112	+ 6 %	+ 78 %
Greece**	9 300	10.7	869	+ 15 %	+ 92 %
Ireland	5 444	4.8	1 134	- 24 %	+ 3 %
Portugal**	11 000	10.3	1 068	+ 40 %	- 12 %
Luxembourg	843	0.6	1 405	- 5 %	+ 155 %
<b>NMS Eastern Europe</b>	<b>46 794</b>	<b>102.7</b>	<b>456</b>	<b>- 12 %</b>	<b>+ 115 %</b>
Poland	16 383	38.0	431	- 21 %	+ 110 %
Baltic States	7 858	6.1	1 288	+ 1 %	+ 75 %
Romania	8 106	19.5	416	- 1 %	+ 146 %
Czech Rep.	4 392	10.6	414	- 11 %	+ 115 %
Hungary	2 594	9.8	265	- 22 %	+ 111 %
Slovakia	2 756	5.4	510	- 5 %	+ 159 %
Bulgaria	2 265	7.1	321	- 10 %	+ 152 %
Croatia	1 324	4.1	323	- 4 %	+ 200 %
Slovenia	1 116	2.1	531	- 23 %	+ 137 %
Switzerland (non-EU)	15 528	8.5	1 827	+ 4 %	+ 78 %

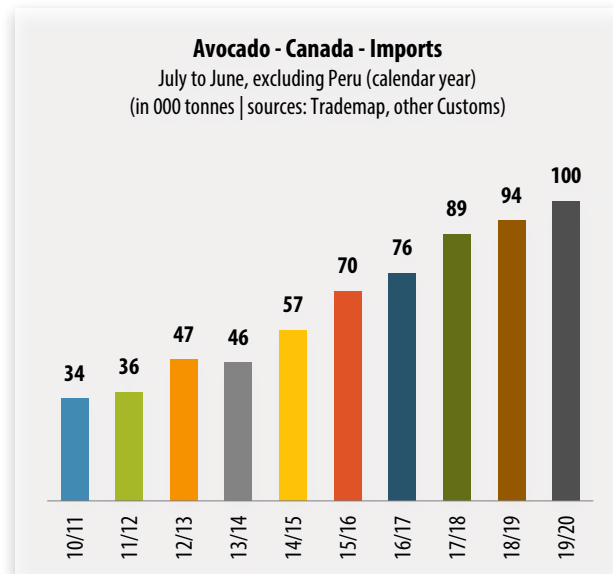
\* Imports+exports+production | \*\* estimate | professional sources, Eurostat

Content published by the Market News Service of CIRAD – All rights reserved



## Canada: 100 000-tonnes mark broken!

The world number three market broke the symbolic 100 000-t mark for imports in 2019-20. While the dynamic is tending to slow down, with a single-digit growth rate for the past two seasons, it nonetheless remains highly significant. Consumption per capita, estimated at 2.7 kg in 2019-20, remained approximately 1 kg lower than in the neighbouring USA. Mexico, which provides practically the entire supply, continues to undertake major promotion efforts. The "Avocado from Mexico" communication is now aiming at increasing purchase frequency, by promoting the multiple possible uses of this fruit, in addition to reiterating its health benefits. Peru now provides a minor top-up supply during the summer season.



**Avocado – Canada – Imports**

in tonnes	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Total</b>	<b>45 193</b>	<b>56 365</b>	<b>78 621</b>	<b>75 109</b>	<b>88 088</b>	<b>95 022</b>	<b>100 048</b>
Mexico*	33 451	44 958	72 004	71 540	82 951	91 111	94 135
Peru	2 905	5 542	2 627	1 130	3 567	1 955	3 224
United States	7 964	4 925	3 308	1 843	507	746	922
Others	873	940	682	596	1 063	1 210	1 767

\*Sources: Trademap, National Customs

© Catherine Sanchez



## Asia disappointing... yet again

Asia is still far from being the third driver for the world market, on which many operators have been reckoning. Despite its undeniable growth potential, its imports went from weak growth to a downturn, i.e. from 160 000 t in 2018-19 to just over 140 000 t in 2019-20. This big potential market at present represents barely 6 % of world trade. Japan, which remains by far the region's number one market, saw its imports decrease to 72 500 t, i.e. approximately 4 000 t less than in 2018-19. The fall was even more considerable for China, a market which is for the moment proving to be more of a mirage than an Eldorado, with imports of 35 000 t, i.e. 12 000 t less than in 2018-19. As for South Korea, volumes imported quite simply practically halved between 2018-19 and 2019-20, going from more than 13 000 t to just over 7 000 t. True, the Covid epidemic played a role, but was a long way from being able to explain everything. Imports were stable (Japan), or even well down on the previous season (China, South Korea) during the period from the start of the season to the start of the pandemic. In fact, the pandemic only aggravated the trend.

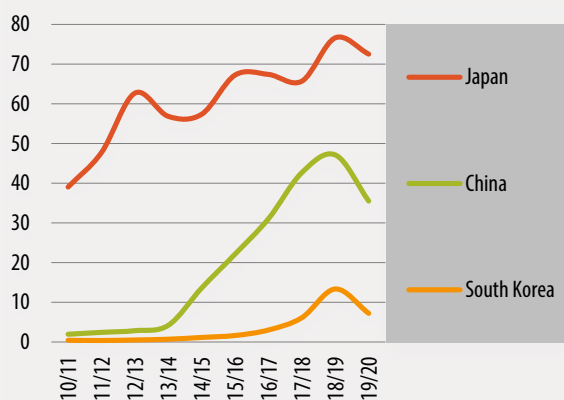


Avocado – China + Hong Kong – Imports

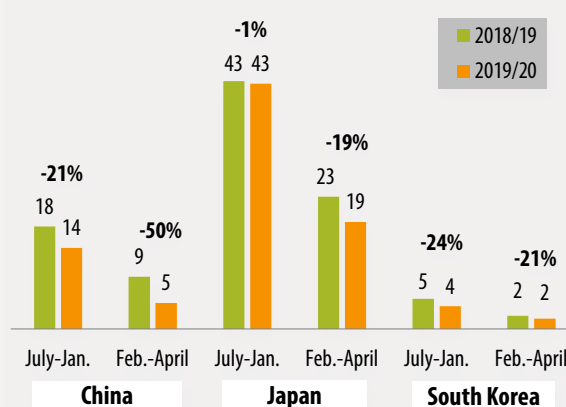
in tonnes	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Total</b>	<b>13 629</b>	<b>22 165</b>	<b>31 068</b>	<b>41 971</b>	<b>47 127</b>	<b>35 588</b>
Peru*	1 154	520	2 802	6 437	17 073	13 589
Chile*	1 092	5 783	13 405	15 029	13 616	11 012
Mexico*	10 794	14 223	10 919	17 690	13 952	8 070
United States	243	1 052	644	1 084	1 011	1 500
Others	346	587	3 298	1 731	1 475	1 417

\* Estimates based on the Customs of the exporting country | Sources: Trademap, National Customs

Avocado - Asia - Imports  
(in 000 tonnes | sources: Trademap, national Customs)



Avocado - Asia - Consumption in pre-Covid and Covid periods  
(in 000 tonnes | sources: Trademap, national Customs)



## Near future of the market... still with the USA and EU-28

This campaign was yet another success for the world avocado trade. While volumes stagnated, the turnover continued to increase with a livelier dynamic. If we analyse the negative points, what we need to take away from this 2019-20 campaign is more the recurrent lack of dynamic from the Asian markets, rather than the downturn in the world trade, which was cyclical and largely due to a supply shortage as a consequence of the Covid pandemic. This season confirmed that tapping into the huge growth potential of the Asian markets will take time. Conquering these markets, which is essential given the world production growth tempo, will also take major investment, both in terms of consumer education and setting up the infrastructures required to ensure decent marketing conditions for a fruit often weakened by long voyages. Hence the two historic mainstays of the world trade, the USA and EU-28, will remain the two main drivers of the world trade in the medium term. The investment to be made in promotion must be in line with the big increase in world production expected in the coming years. At present, Europe is clearly not doing its bit ■



## Winter avocado campaign

### New critical periods to be monitored in the EU-28?

On paper, we were set for a quiet winter 2019-20 campaign, thanks to restrained growth in export potentials, and to an extended trading calendar, with the summer season coming to an early end. The reality was very different. Although the figures were highly satisfactory overall, the first part of the season was much tougher than expected, with prices slipping to a distinctly below-average level from mid-November to mid-January. Why was there such a slump? November and December brought a massive supply, with total volumes through Customs of 110 000 t from the main winter market suppliers over these two months, as opposed to 90 000 t in 2017 and 2018. On the one hand, Colombia saw a considerable surge, with nearly 13 000 t registered by Customs over the period November/December, as opposed to just over 7 000 t in the two previous seasons. Yet above all incoming Mexican shipments enjoyed a genuine boom, with just over 28 000 t according to Customs, as opposed to 15 000 t and 11 000 t respectively in 2017 and 2018. Taking a bit of a step back, we can see that the Mexican trading calendar was completely atypical and hyper-concentrated between August and December in 2019-20, with more than 80 % of its volumes shipped during this period, as opposed to 50 % in previous seasons, with 60 % from October to December, as opposed to 40 % usually.

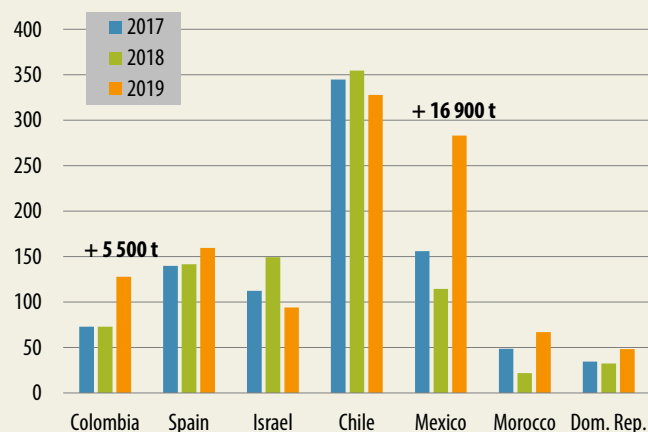
Why such a change? This is an important question, since it could be a structural trend. Jalisco, generating more than 50 % of shipments to the EU-28 in 2019-20, saw its production peak earlier than

Michoacán, during this August-December period. In view of the very rapid growth dynamic of Mexican exports to the EU-28 (volumes increasing 6-fold in five years, enabling Mexico to take second place among the winter market suppliers, with more than 70 000 t in 2019-20), such a change could greatly affect the market balance during this already heavily-laden period. However, we can take some reassurance. This boom in volumes seems due above all to the pull of the extraordinary prices registered at the beginning of the season, which peaked at nearly 18 euros/box in early November for the sizes most in demand. Nonetheless, over the coming campaigns, we will need to keep a close eye on the consequences of the rapid rise to prominence of a large-scale supplier with an early production calendar.

The increasingly massive incoming shipments of Colombian avocados may also alter the market's supply structure at certain periods. The increase in volumes during the first part of the season has already been stated, but this is also, and even more significantly, the case at the end of the season. There were very substantial incoming shipments in May and June (between 4 500 and 5 000 t during these two months, according to Customs), when the supply is in the hands of the summer market suppliers. These additional volumes, and the rapidly growing volumes from Peru's Olmos region, are, as we saw in 2020, able to pressurise the small fruit market, which accounts for a large part of the supply from these two production zones.

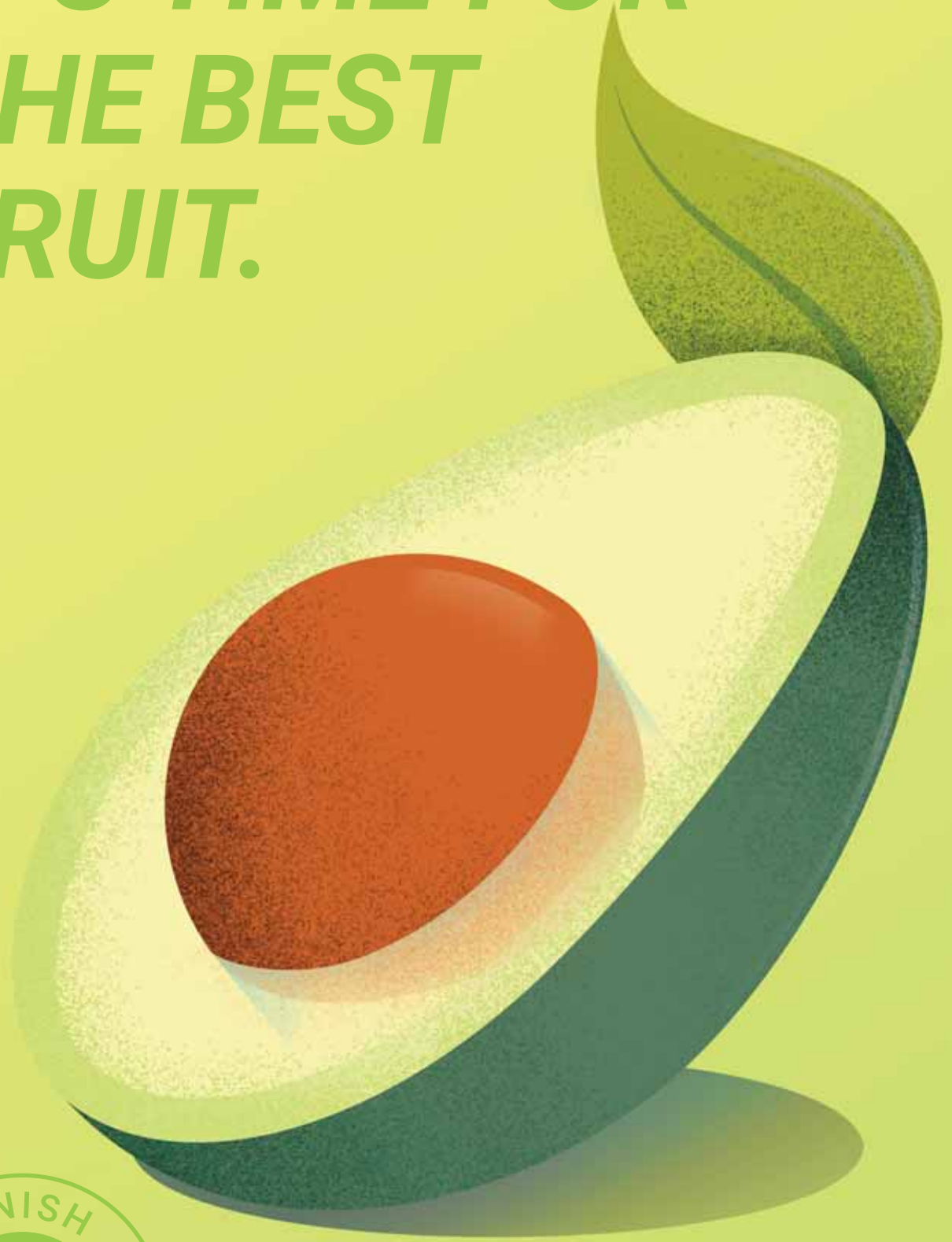
Avocado - EU-28 - Imports in November-December

(in 000 tonnes | source: Eurostat)



© Régis Domergue

**IT'S TIME FOR  
THE BEST  
FRUIT.**



For more information please contact us at [info@frutasmontosa.com](mailto:info@frutasmontosa.com)



Content published by the Market News Service of CIRAD – All rights reserved

**montosa**



# Advance review of the summer 2020 avocado season on the EU market

## A catastrophic scenario

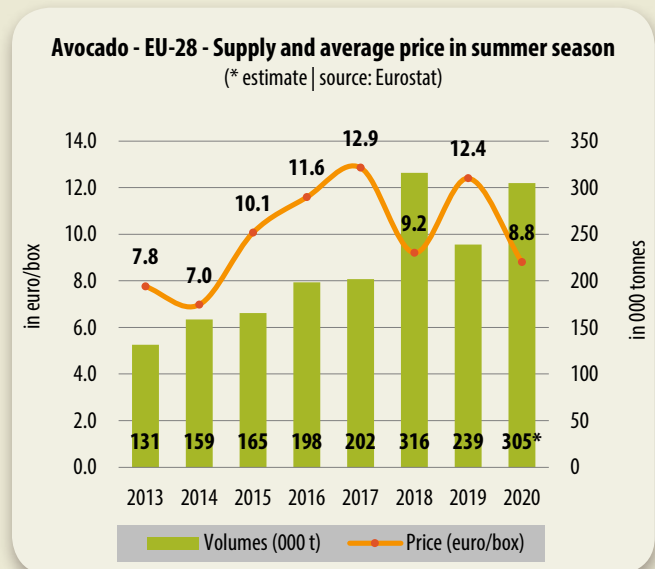
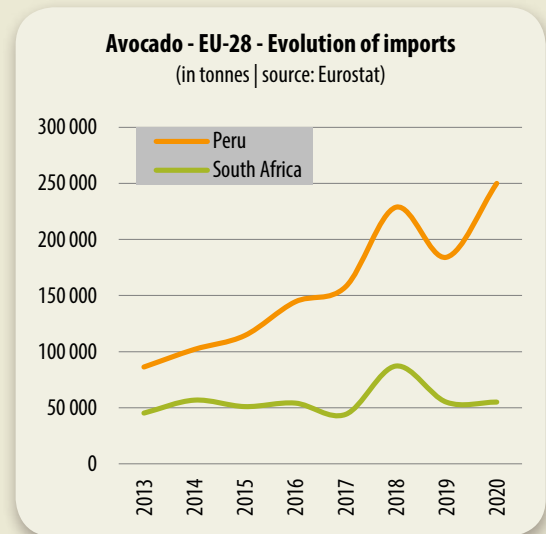


© Régis Domergue

Could we call it an avalanche? No, that wouldn't be quite right, since while it is a good description of the mountain of fruit crashing down on the EC market, there was nothing unpredictable about it. In the present case, the record level of the Peruvian supply – and the associated risk of over-supply – was all too well known. According to our estimate, based at present solely on the professional figures from South Africa and Peru (approximately 80 % of the overall summer season supply to the EU-28), the supply seems to have been nearly as big as in 2018, in excess of 300 000 tonnes. Peru shipped record volumes to the EU-28, probably of around 240 000 to 250 000 t across all varieties (+ 55 000 to 65 000 t from 2019, and + 10 000 to 20 000 t from 2018). Conversely, despite rising production, shipments from Southern Africa should “only” register a similar level to 2019, approximately 30 000 t down on 2018. There was an enormous supply in June, with shipments from Peru alone of between 3 and 3.4 million boxes throughout the month, with indeed a peak of nearly 4 million boxes. To put it in nautical terms, this might be akin to scuttling... Unsurprisingly, our price barometer is registering its worst level since 2014-2015. Rates plummeted from early June, reaching rock-bottom levels at the end of the month, at which they were stuck until late July. The situation was particularly critical for large fruit, with the price for a 4-kg box dropping below the 4 euros mark in late June. Prices maintained a level below 7.5 euros for seven weeks for sizes 16 to 20, and for twelve weeks for size 12/14. If we only look at the above-mentioned seven-week period, the turnover for the European market, over-evaluated since it is calculated based on size 18, went down by more than 40 % from 2019, while incoming volumes from Peru and South Africa were 44 % greater (+ 7 million boxes approximately).

Are there external factors explaining such a massive oversupply to the European market? Not really: Peruvian exporters pulled off the difficult feat of maintaining a similar level of shipments to 2018 and 2019 to the USA, in a much more heavily laden context in terms of Californian and Mexican Hass. Furthermore, they also managed a rise on the Asian diversification markets and in Chile, albeit these markets remain modest compared to the EU-28 and USA. Did the Covid pandemic curb demand in the EU-28? Perhaps, but very probably not in major proportions (see inset). Clearly, and above all, it was the supply which was much too heavy. Lessons need to be learned from this eminently predictable crisis.

This advance review will of course need to be refined, after the release of the Customs figures, which will also enable us to factor in volumes from other suppliers such as Kenya, Tanzania, Brazil and also Colombia, present in August.



**Avocado – EU-28 – Supply in summer season** (South Africa + Peru = approx. 80 % of market)

in tonnes	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Total</b>	<b>111 701</b>	<b>131 425</b>	<b>158 684</b>	<b>165 283</b>	<b>198 461</b>	<b>201 728</b>	<b>315 896</b>	<b>239 057</b>	<b>305 000</b>
Peru	62 618	86 260	101 971	114 321	144 367	157 744	228 769	184 109	250 000
South Africa	49 083	45 165	56 713	50 962	54 095	43 984	87 127	54 948	55 000

Professional sources, Customs

A close-up photograph of a branch from an avocado tree, heavily laden with green, bumpy-skinned avocados. The leaves are dark green and glossy. The background is a soft-focus green, suggesting a healthy orchard.

# EXOS<sup>®</sup> PREMIUM

THE TROPICAL FRUITS REFERENCE  
IN MOROCCO

## PACK FRUIT

Mailing address : 2, Rue Lahcen El Basri, N°6, 20040 Casablanca - Morocco

Phone : +212 5 22 22 24 88

Email : [commercial.packfruit@gmail.com](mailto:commercial.packfruit@gmail.com)



# Avocado

## Winter 2020-2021 forecasts for the European market

### One more time?

by **Eric Imbert**, CIRAD  
eric.imbert@cirad.fr

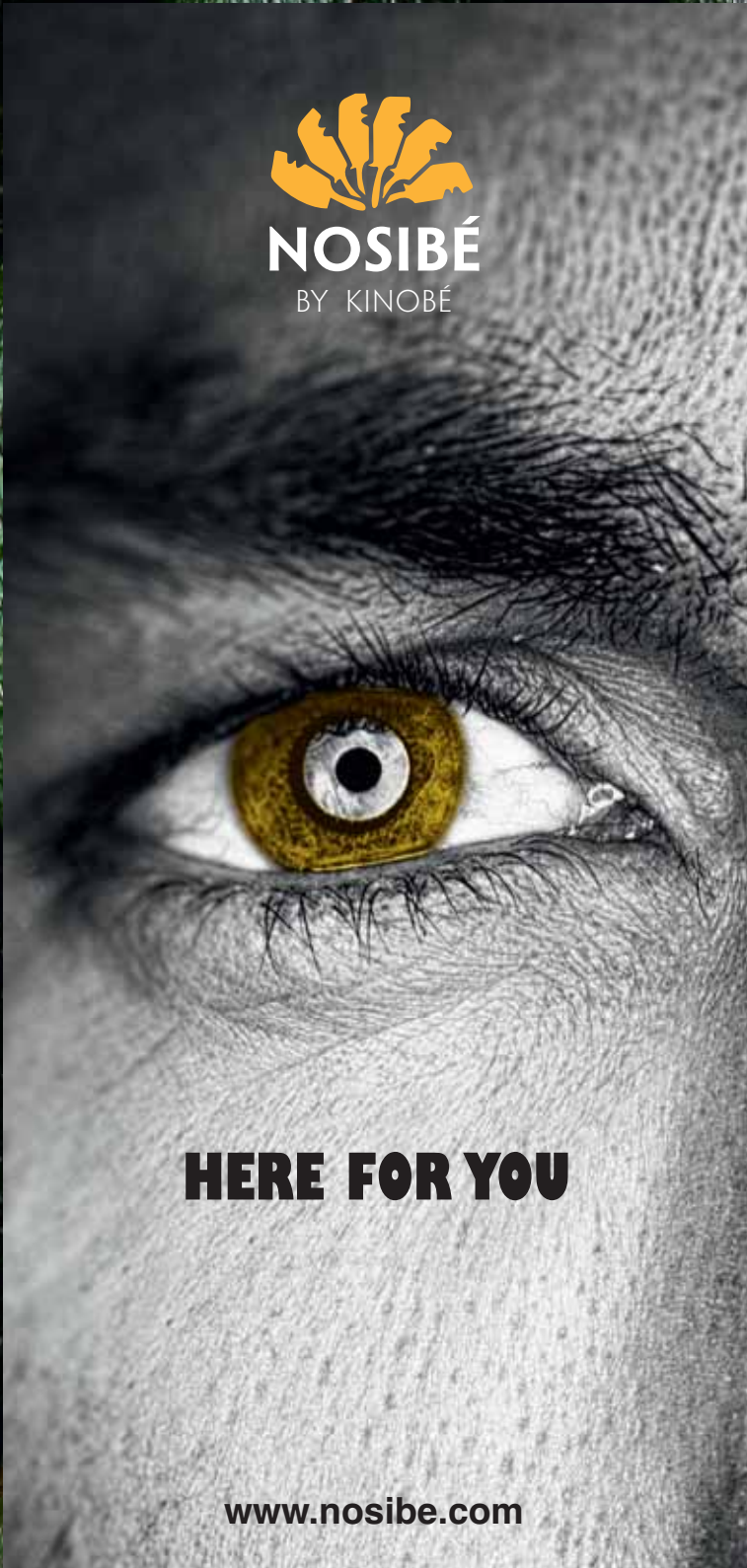
According to the initial information available, the supply level expected to the EC market for this winter 2020-21 season appears to be similar to the previous year. On paper at least, which is important to specify in these times of the Covid-19 pandemic, still troubled and uncertain in all aspects. Nonetheless, while the scenario seems rather favourable in view of a growth dynamic in consumption which only wants to express itself, the distribution of these volumes over time is worthy of consideration. FruiTrop offers you this review.







**NOSIBÉ**  
BY KINOBE



**HERE FOR YOU**

[www.nosibe.com](http://www.nosibe.com)



© Guy Brehmer



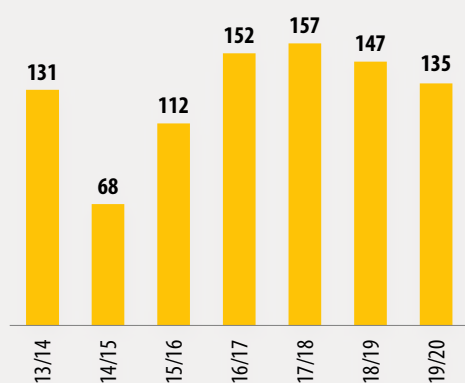
## CHILE

### Hit by the climate context once again this season

Once again this season, the Chilean harvest will bear the scars of an umpteenth tough year in terms of climate. On the one hand, the recurrent drought, which farmers have now faced for a decade, hit the heights in 2019, and its effects could not be mitigated by the good levels of rainfall registered in recent months. Hence for the first time orchards were cut down in the heart of the historic cultivation zone of the Aconcagua valley. On the other hand, temperatures were unfavourable during fruit-setting. Professionals estimate that production could be down by 15 to 25 % on 2019-20, which was already below average for recent years.

**CHILE:**  
 Nearly 26 000 ha of Hass  
 World No. 3 exporter

**Avocado - Chile - Exports**  
 (in 000 tonnes | source: Chilean Customs)

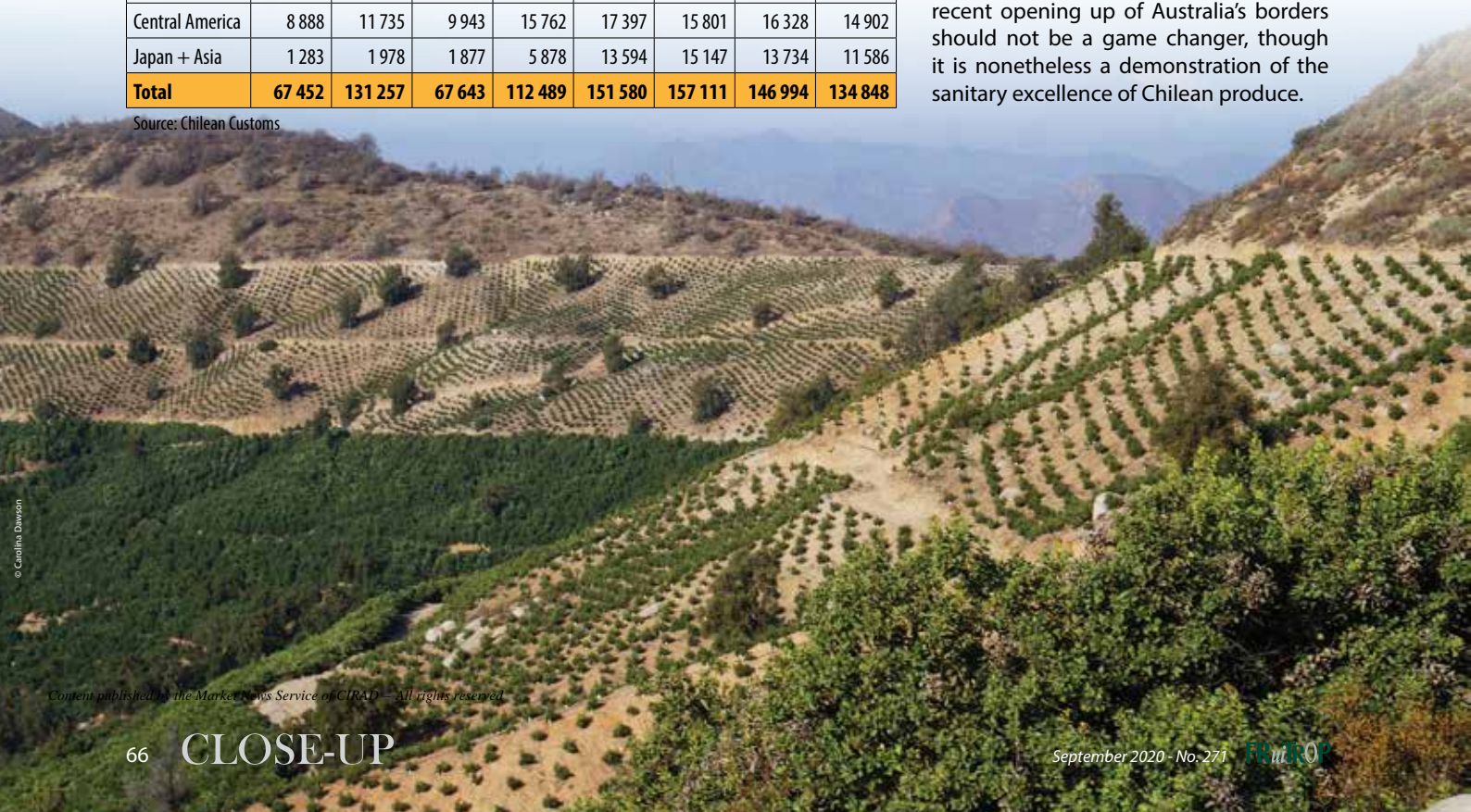


Despite this “lean harvest” and the local market maintaining an extremely big volume and price appeal, Chile should remain indisputably the world number three exporter, with an exportable potential of probably between 110 000 and 120 000 t. It will also retain its place as the leading supplier to the European Union, a destination to which exporters are increasingly tending to focus their flows. Shipments to the USA, formerly the country’s top market, fell away further last season (just over 12 000 t), and should not see any recovery this season, far from it. Its diversification markets in Latin America (primarily Argentina) and Asia (primarily China) are significant (25 000 to 30 000 t depending on the season), but they should remain relatively static, as in recent seasons, given the production context. The recent opening up of Australia’s borders should not be a game changer, though it is nonetheless a demonstration of the sanitary excellence of Chilean produce.

**Avocado – Chile – Exports**

in tonnes	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
EU-28	42 571	64 247	43 481	79 421	91 385	93 496	88 200	96 034
USA	14 710	53 297	12 341	11 428	29 204	29 389	27 999	12 189
Central America	8 888	11 735	9 943	15 762	17 397	15 801	16 328	14 902
Japan + Asia	1 283	1 978	1 877	5 878	13 594	15 147	13 734	11 586
<b>Total</b>	<b>67 452</b>	<b>131 257</b>	<b>67 643</b>	<b>112 489</b>	<b>151 580</b>	<b>157 111</b>	<b>146 994</b>	<b>134 848</b>

Source: Chilean Customs







YOUR AVOCADO  
SPECIALIST FOR MORE  
THAN 25 YEARS.

**Our ambitions:** to offer you ripening solutions tailored to your requirements. Backed up by a structure with cutting-edge technologies, our know-how dedicated to ready-to-eat and triggered fruit, and all types of packing, is based primarily on the experience of our teams.

**Our commitments:** providing you with a daily service from the sources, Brazil, Chile, Colombia, Dominican Republic, Israel, Kenya, Mexico, Peru, South Africa, Spain, Tanzania, Zimbabwe, etc. with optimum quality ensured all year round.

**Our expertise:** the ability to develop partnerships based on quality projects, and jointly anticipate new market developments.

World wide producer and French  
leader in avocado distribution.



Visuel - Getty Images



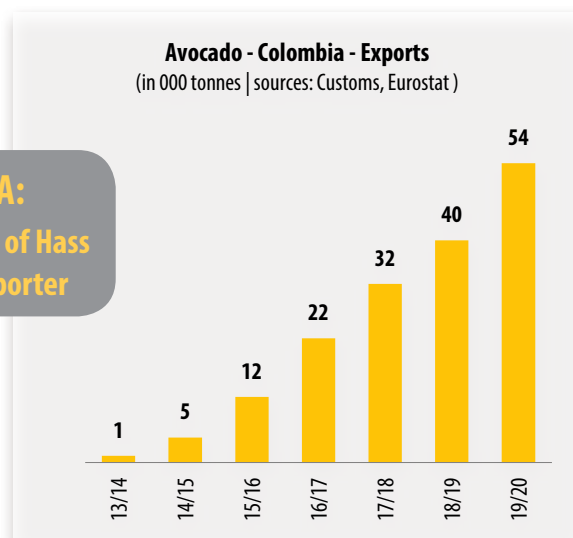
# COLOMBIA

## Boom continuing

Colombia continued to strengthen its position on the EC market in 2019-20 (no. 4 winter season supplier, with shipments of approximately 55 000 t), and this trend will continue in 2020-21. The entry into production of expanding well-managed large-scale young orchards, planted by big worldwide avocado groups established in the country, should increase both the rate of production growth, and the average quality level. In addition, the Colombian supply retains major assets for European importers, in terms of both commercial conditions (guaranteed minimum contracts, often with a low level) and logistics (12-day voyage between Cartagena and Rotterdam). Professionals estimate that Europe-bound volumes could increase by approximately 20 to 30 % in 2020-21.

The outlet diversification trend will also continue. Shipments to the USA will rise, though they should nonetheless remain minor, since the protocols are still restrictive despite easing in 2019. Conversely, exporters should try to make slightly more progress in their breakthrough onto the Chinese and Japanese markets, which opened in 2019, and maybe onto the South Korean and Chilean markets. For the latter, negotiations on the entry of Colombian Hass are very advanced. The unusual rains registered in August and September will probably delay the surge in volumes, which should only start to peak toward late October.

**COLOMBIA:**  
Nearly 30 000 ha of Hass  
World No. 9 exporter



**Avocado – Colombia – Exports**

in tonnes	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
EU-28	508	1 173	3 050	11 691	22 045	31 403	37 775	49 115
USA	-	-	-	-	-	89	764	1 641
Others	30	38	1 450	100	292	607	1 413	3 063
<b>Total</b>	<b>538</b>	<b>1 211</b>	<b>4 500</b>	<b>11 791</b>	<b>22 337</b>	<b>32 099</b>	<b>39 952</b>	<b>53 819</b>

Sources: Customs, Eurostat



**30**  
**+ YEARS**  
Post harvest  
solutions

**WITH LIVENTUS YOUR DESTINATION  
POSSIBILITIES ARE EXTENDED.**

## **CONTROLLED ATMOSPHERE**

COMPETITIVE ADVANTAGES



Technical support  
during season



Unique atmosphere set points based  
on research taking into consideration:

- ▶ *Transit time*
- ▶ *Quality specifications*



Plug & Play system:

- ▶ *Flexibility*    ▶ *Information*
- ▶ *Accuracy*    ▶ *Independent battery*



 Commercial contacts:

 [sales.cl@liventusglobal.com](mailto:sales.cl@liventusglobal.com)

 [sales.pe@liventusglobal.com](mailto:sales.pe@liventusglobal.com)

[www.liventusglobal.com](http://www.liventusglobal.com)





© Carolina Dawson

# MICHOACÁN

## A giant in better shape than ever

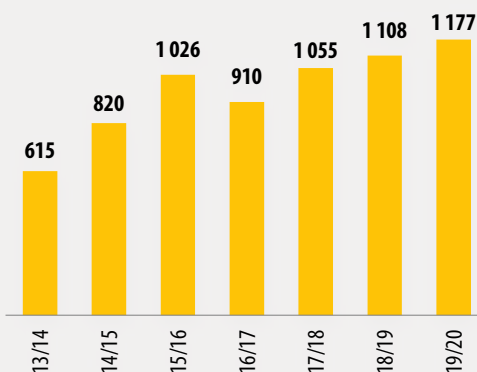
The forecasts of the Mexican Hass Avocado Importers Association (MHAIA) are showing good health: the Mexican harvest appears to be bigger than ever! Expansion of surface areas approved for export, and the absence of major climate incidents, should enable a production rise of approximately 30 % on 2019-20 for “flor loca”, and just under 20 %

for “aventajada” and “marceña”. The issue of distribution of volumes between markets seems more crucial than in other seasons. True, the proportion sent to the USA will remain low, but a few more percent in the export potential of the world’s number one exporter can represent large volumes. Moreover, the fall in trade due to the Covid-19 is weighing down on volumes sold in the USA, as is attested by the low prices still being charged at the time of going to press.

In this context the EU market might appear to be an interesting alternative this season, at the very least at the beginning of the season. However, exporting to the EU-28 will remain more complex than exporting to the USA, especially because of longer logistics and more restrictive trading standards.

Furthermore, the price fall which occurred in November/December 2019 on the Old Continent resulted in heavy losses for certain Mexican operators. Hence the number of exporters who chose to take a risk on the European market should remain low, and the level of financial guarantees they will request will prevent volumes of a level likely to destabilise the market in the long term.

**Avocado - Michoacán - Exports**  
(in 000 tonnes | source: Mexican Customs)



**MICHOACÁN:**  
Nearly 170 000 ha of Hass  
World No. 1 exporter

**Avocado – Mexico – Exports**

in tonnes	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
USA	522 488	516 085	693 344	862 457	759 318	861 393	938 953	999 541
Canada	35 044	33 632	44 958	62 148	71 607	83 346	88 854	89 010
Japan	55 883	51 626	53 175	64 864	62 459	60 455	69 960	66 150
EU-28	9 137	5 690	12 996	47 689	38 768	62 146	48 348	73 097
Others	34 893	26 386	42 597	44 092	33 820	66 306	51 465	44 213
<b>Total</b>	<b>657 445</b>	<b>633 418</b>	<b>847 070</b>	<b>1 081 250</b>	<b>965 972</b>	<b>1 133 646</b>	<b>1 197 580</b>	<b>1 272 012</b>

Source: Mexican Customs



© Carolina Dawson



AVOCADO LOVERS

DELIVERING  
EXCELLENCE

COMPañIA  
  
*Aguacatera*  
DEL SUR

Content published by the Market News Service of CIBAD. All rights reserved.

[import@aguacateradelsur.com](mailto:import@aguacateradelsur.com)

+34 952 650 823



# JALISCO

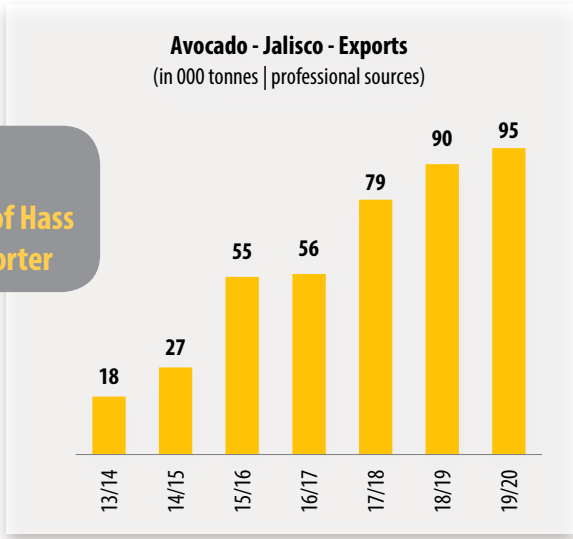
## A young leader, set for further consolidation in 2020-21

While Jalisco remains small-scale in terms of Mexican production, it already occupies a major position on the international Hass market. After shipping volumes approaching 100 000 t in 2019-20, Mexico's number two exporter State is now number 4 in the world market suppliers ranking. Its success was built in record time, with exports still crawling along at under 20 000 t in 2013-14. This dynamic will continue in 2020-21, thanks to climate conditions which are decent without being excellent, and to young orchards entering production and coming into their prime.

The exportable potential should rise by approximately 10 %, according to professional sources. Volumes should be more fairly distributed than last season between the country's three main markets (European Union, Japan and Canada) and better distributed over time, with the European market less appealing than at the start of the 2019-20 season. Nonetheless, shipments will remain concentrated mainly from November to January, now a risky period on the EC market. The opening up of the US market is more than ever a strategic avenue, with the arrival of a new executive committee at APEAJAL (Asociación de Productores Exportadores de Aguacate de Jalisco), and a perhaps less protectionist policy in the USA, depending on the result of the Presidential elections. Nonetheless, it is unlikely that the opening of the borders can be formalised soon enough to make a significant impact on this campaign.

Exporters based in Jalisco and Michoacán will be able this season to take advantage of a new sea-freight link with Europe, set up by UPM (United Producers of Mexico, the body responsible for promoting agricultural trade between Europe and Mexico), and operated by Greensea. It has the huge asset of serving the port of Rotterdam in 12 days from Veracruz. The produce will be transported on conventional ships, twice a month (3 000 pallets in the hold and 24 containers on-deck, initially). The first departure was on 15 September 2020.

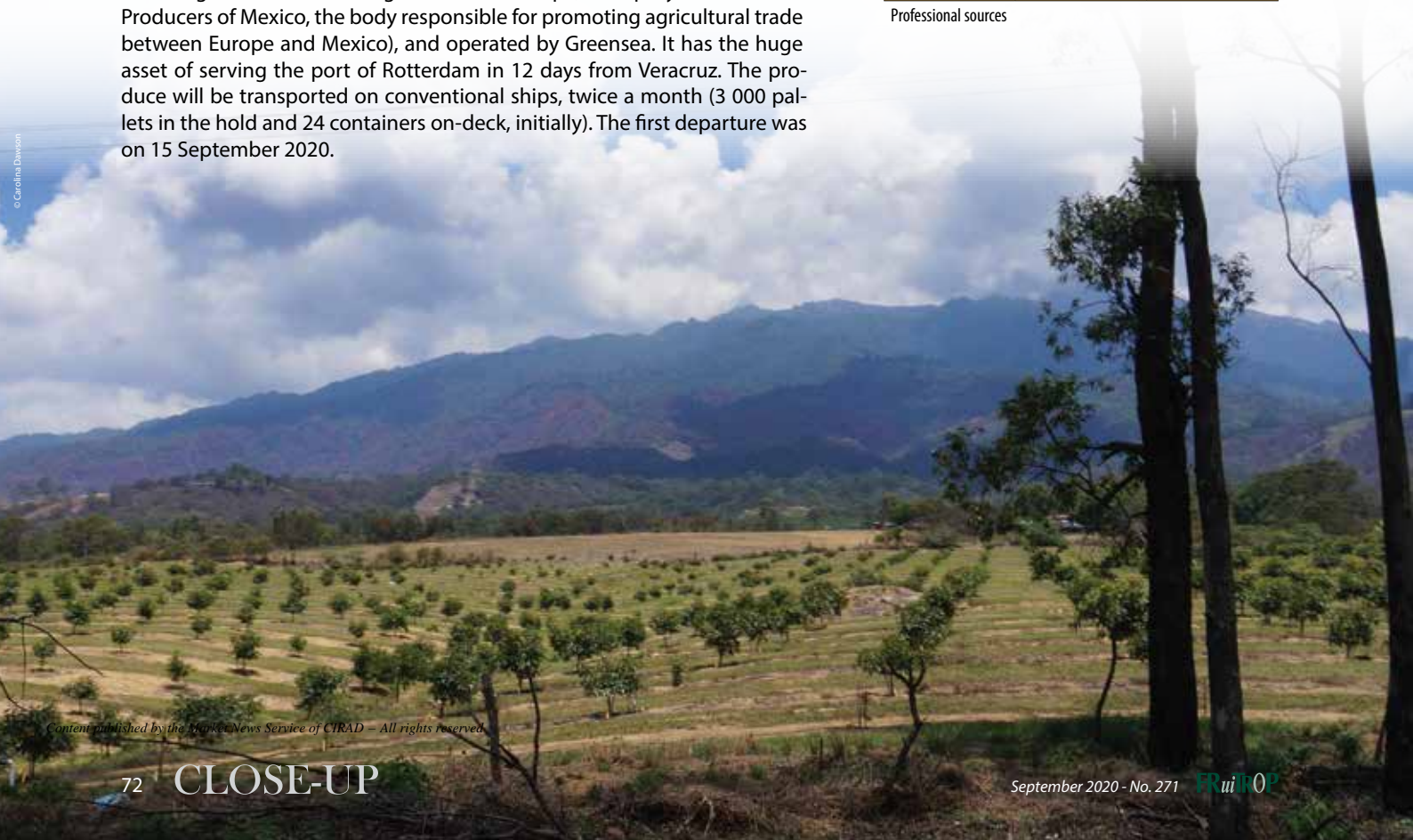
**JALISCO:**  
 Nearly 35 000 ha of Hass  
 World No. 4 exporter



in tonnes	2018-19	2019-20
EU-28	26 974	36 612
Canada	31 500	30 763
Asia	31 026	27 585
Others	446	496
<b>Total</b>	<b>89 587</b>	<b>94 959</b>

Professional sources

© Carolina Dawson







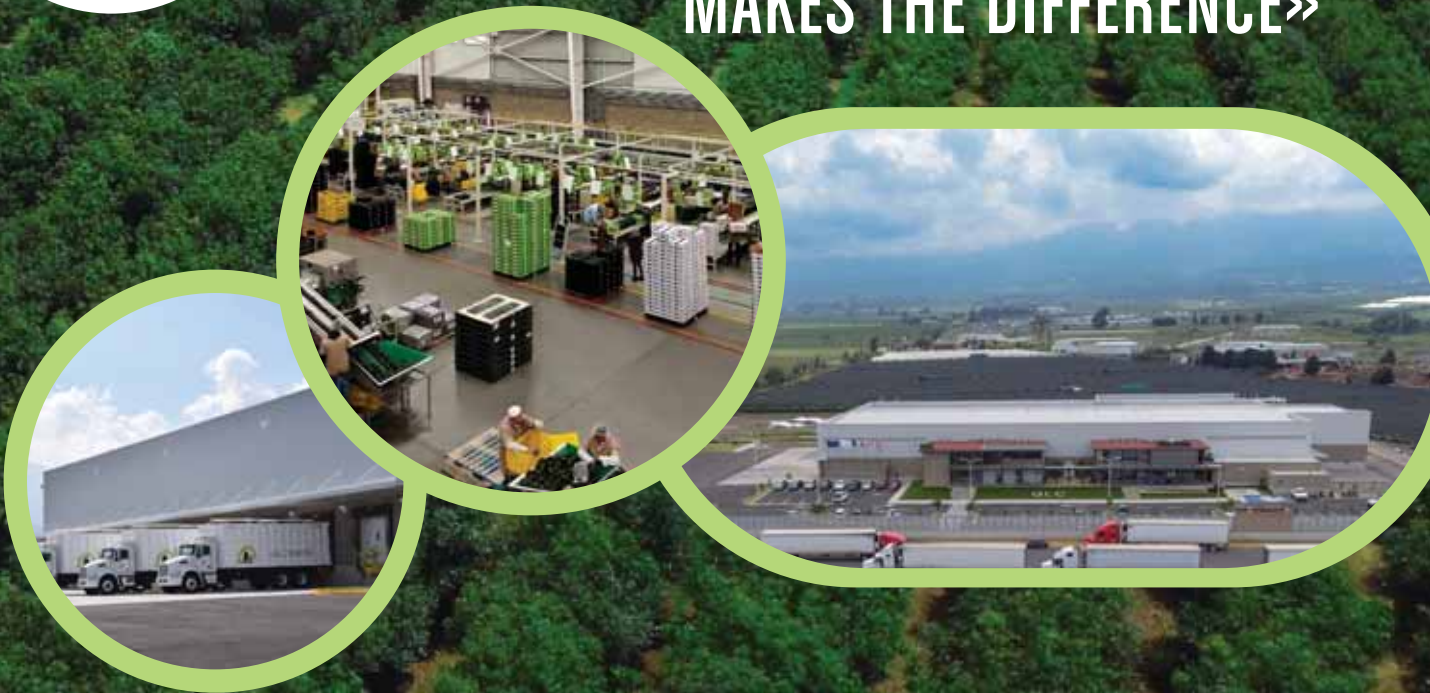
EXCELENCE  
COMMITTED  
TO THE  
WORLD



Grupo Aguacatero Los Cerritos is a Mexican Company dedicated to **GROW, HARVEST, PACK AND DISTRIBUTE HIGH QUALITY AVOCADOS** with great flavor, appearance and condition, in a continuous supply through **365** days cycle.

A **SUSTAINABLE PROCESS** allows us to have a maximum waste reduction, having an environmental care oriented by respect towards life and nature, and the correct use of resources.

«OUR EXPERIENCE  
MAKES THE DIFFERENCE»



A company of Grupo Los Cerritos  
[www.grupoaguacatero.com.mx](http://www.grupoaguacatero.com.mx)

Grupo Aguacatero Los Cerritos is certified by:



SMETA 4 PILLARS CERTIFIED



Content published by the Market News Service of CIRAD – All rights reserved



SRRC







# ISRAEL

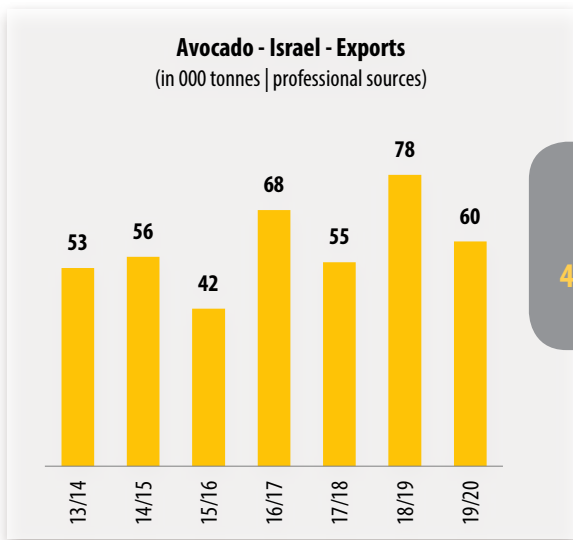
## Opposing trends

The return of an alternate bearing upswing season in Israel and Spain hinted at a fine harvest for 2020-21 in the Mediterranean. However, both these countries were affected by a heatwave to illustrate, if it were still needed, the effects of climate change. While the harvests expected in 2020-21 in these two countries bear the mark of the soaring mercury, other factors with a potentially offsetting effect should also be taken into consideration.

In Israel, the spring 2020 flowering was promising, after a light 2019-20 season (approximately 95 000 tonnes, i.e. - 26 % on 2018-19 and 10 % below the 2-year average). Yet toward mid-May, a heatwave of extraordinary intensity and

length caused major fruit droppage in several zones, hitting certain major operators hard. However, the Israeli cultivation area has expanded by more than 3 500 ha since 2017, and these plantations should start to make themselves felt as they enter their prime. In the face of these opposing trends, there are several harvest forecasts doing the rounds, ranging in level from as limited as in 2020-21 to average. The local market, which is developing and modernising more with every passing year, will remain a major competitor for exports, particularly in a context where the shekel remains strong.

**ISRAEL:**  
 Nearly 12 000 ha  
 48 % green varieties + 52 % Hass  
 World No. 6 exporter



**Avocado – Israel – Exports**

in tonnes	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
EU-28	35 117	42 844	46 086	34 995	56 600	41 567	60 101	43 465
Others	8 177	10 100	9 888	6 224	11 773	12 945	17 688	16 535
<b>Total</b>	<b>43 294</b>	<b>52 944</b>	<b>55 975</b>	<b>42 067</b>	<b>68 373</b>	<b>54 512</b>	<b>77 789</b>	<b>60 000</b>

Professional sources, Eurostat








# GALILEE-EXPORT

Founded and owned by the growers  
Galilee supplies produce direct  
from the field to your warehouse  
for optimal quality of service

*Israel + Peru + Chile + Mexico + Kenya*

Avocado available all year round



36/40 rue de Perpignan 94642 RUNGIS, FRANCE | Tel: +33 (0)1 46 87 28 59  
| Fax: +33 (0)1 46 87 94 50 | [ely@galil-export.com](mailto:ely@galil-export.com) | [www.galilee-export.com](http://www.galilee-export.com)

3040, route de Banon, Les VIGNERES 84300 CAVAILLON, FRANCE  
Tel: +33 (0)4 90 76 68 68 | Fax: +33 (0)4 90 05 87 90



**Galilee**  
...direct from the field

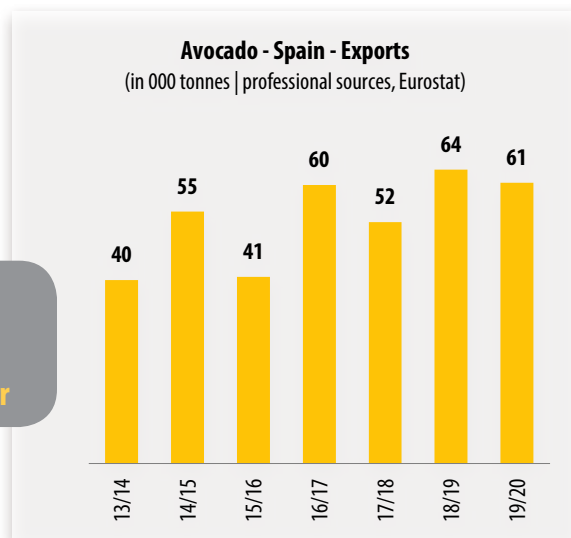


# SPAIN

## An average harvest

The scenario seems fairly similar in Spain, where a heatwave in early August appears to have taken its toll on what was seemingly a fairly decent harvest. Hence volumes available should be fairly similar to last season's average levels. However, unlike Israel, the big expansions in surface areas in recent years, particularly in the new production areas of Cadiz, Huelva and Valencia, should not yet exert any significant influence, with the orchards still very young. Sizing appears to be rather satisfactory at present, since the spring rainfall was considerably above average. Nonetheless, the abnormally hot summer very much ate into reserves, and the level of the main dam supplying the Axarquía agricultural sector, the Viñuela dam, is well below average (32 % full in early September 2020, as opposed to 58 %), and even below last year's level (35 % full). A good rainfall level is required this autumn to prevent a crisis situation.

**SPAIN:**  
 Nearly 14 000 ha  
 World No. 8 exporter



Avocado – Spain – Exports

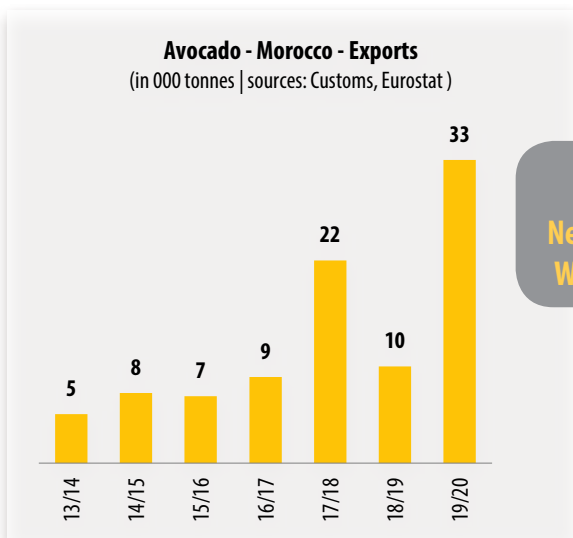
in tonnes	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Intra-EU-28	38 500	36 700	50 600	37 600	54 600	48 600	57 100	57 100
Extra-EU-28	7 700	3 100	4 000	2 900	5 800	3 718	6 600	3 750
<b>Total</b>	<b>46 200</b>	<b>39 800</b>	<b>54 600</b>	<b>40 500</b>	<b>60 400</b>	<b>52 318</b>	<b>63 700</b>	<b>60 850</b>

Professional sources, Eurostat



© Right Domergue

Avocado - Morocco - Exports (in 000 tonnes | sources: Customs, Eurostat)



**MOROCCO:**  
 Nearly 6 000 ha of Hass  
 World No. 10 exporter

# MOROCCO

## An off year, after the production boom of 2019-20

Morocco indisputably joined the big boys in 2019-20. Exports, still aimed nearly entirely at the EU-28, were in excess of 30 000 t, after a leap of more than 20 000 t from 2018-19, illustrating the explosive expansion of the cultivation area. 2020-21 should bring a lighter season. There is a considerable alternate bearing downswing, in a climate context free from extreme incidents, but marked by a lack of rainfall. With very many small orchards entering production and coming into their prime, this should help mitigate the fall, which has been estimated at between 10 and 20 %. There will be a more considerable downturn for the green varieties than for Hass. The sizing should be up slightly.

Avocado – Morocco – Exports

in tonnes	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
EU-28	840	4 766	7 293	7 141	9 237	21 787	10 334	32 649
Others	317	562	301	131	122	190	157	200*
<b>Total</b>	<b>1 157</b>	<b>5 328</b>	<b>7 594</b>	<b>7 272</b>	<b>9 359</b>	<b>21 977</b>	<b>10 491</b>	<b>32 849*</b>

\* estimates | Sources: Comtrade, Eurostat

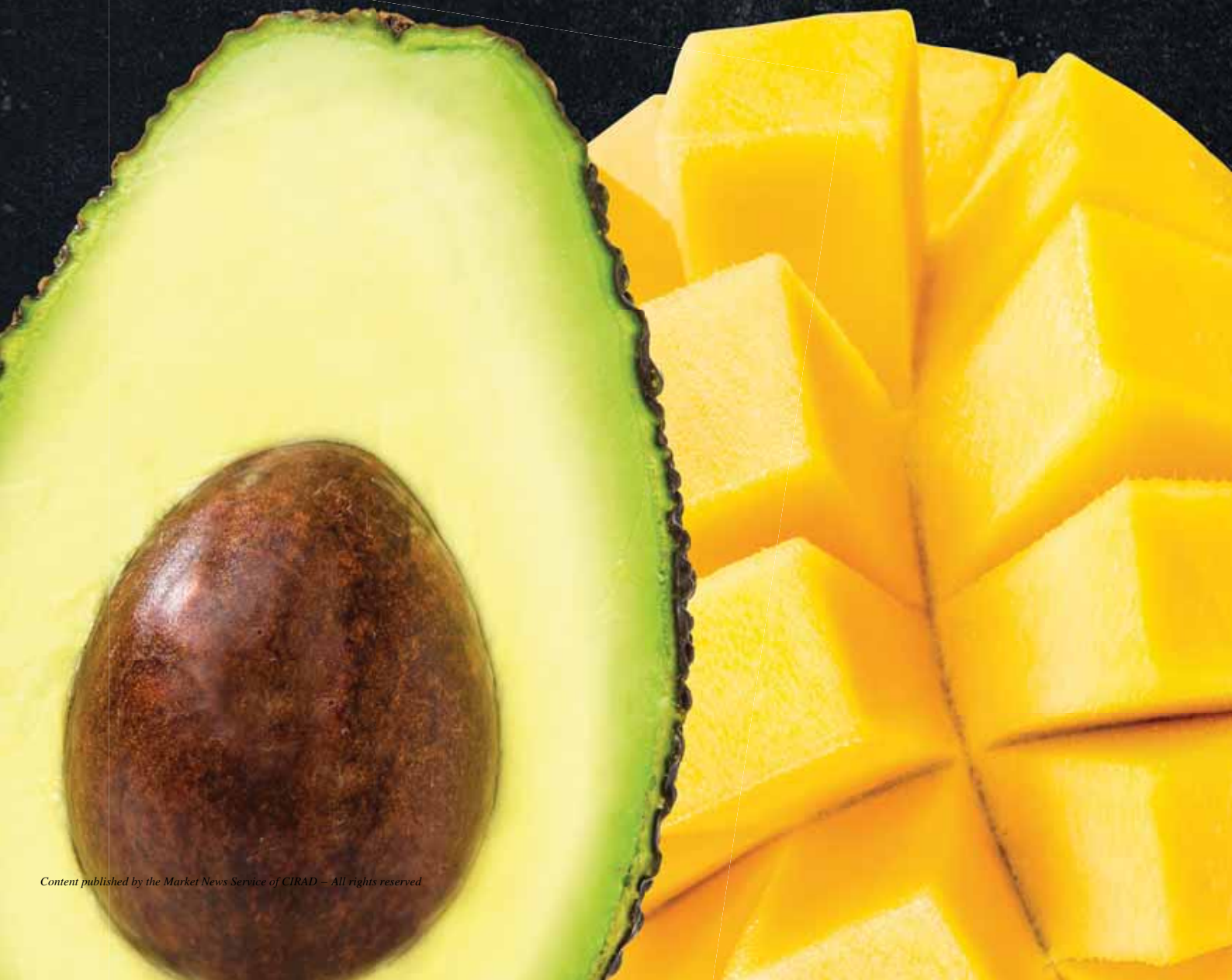


**Reyes Gutiérrez**

tropical fruits

**365** **days**

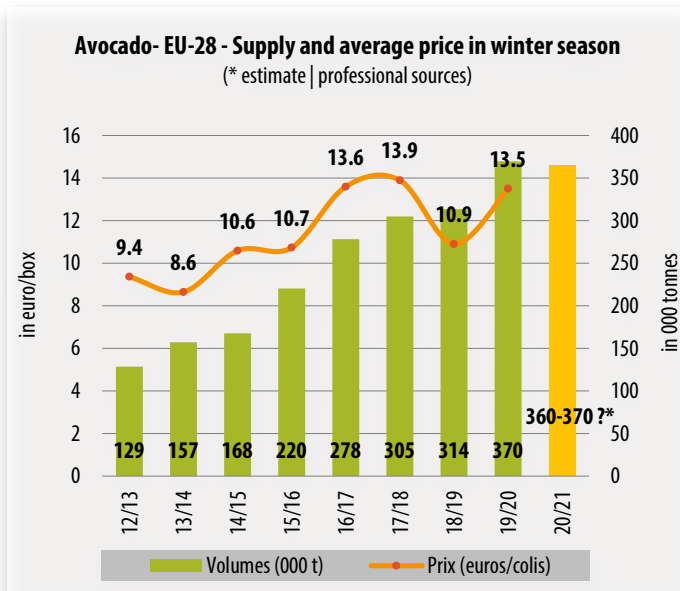
Healthy **X**  
NATURE





## Overall supply similar to 2019-20...

Hence if these forecasts come true, the overall supply to the EC market (+ the UK) should barely be any different to 2019-20, subject to the effects of the Covid epidemic. On the latter point, the summer campaign which has just finished provided some fairly reassuring lessons. In the upstream segment, the export flow could be kept at a near-normal level, albeit through much more arduous and more complex daily management for the operators. In the downstream segment, sales volumes do not seem to have been hard hit, even at the height of the crisis. True, the hotels, catering and café market segment was paralysed for weeks on end, and has since then been idling. Yet while this is a significant outlet, it is not a major one on most of the Old Continent's markets (estimated at 5 to 10 % in Germany, and 10 to 15 % in France). Furthermore, data from the panels show that retail sales held up rather well (see inset).



## ...but a narrower trading window

The distribution of these volumes over time should also be considered. On the one hand, the trading window for this winter 2020-21 campaign will be narrower than in 2019-20. Just as in 2018-19, the winter season will start late, given the extension of a heavily laden summer season. There are consequences for this, since with approximately four fewer weeks' sales the supply available during the winter season will need to be sold over approximately six rather than seven months. It is a simple calculation: for an identical volume, this one-month campaign reduction equates to a 15 % increase in volumes per month to sell. This scenario of a contracted winter campaign could well become the norm in the coming years because of the very rapidly expanding cultivation areas in Peru, South Africa and Kenya.

### Avocado – Supply trend in 2020-21

in 000 tonnes	Export 2019-20	of which to EU-28	2020-21 / 2019-20 trend
Chile	134.8	96.0	- 15 to - 25 %
Israel	60.0	43.5	0 to + 20 %
Spain	60.9	57.1	≈
Morocco	32.8	32.6	- 10 to - 20 %
Colombia	53.8	49.1	+ 15 to + 25 %
Jalisco	95.0	36.6	+ 10 to + 15 %
<b>Total, 6 supplier countries</b>	<b>437.4</b>	<b>315.0</b>	<b>0 to - 5 %</b>
<b>Michoacán</b>	<b>1 177.1</b>	<b>36.5</b>	<b>+ 10 to + 20 %</b>
		<b>Total EU-28</b>	<b>0 to - 5 % ???</b>

Professional sources, Eurostat



*Our Job*

To be involved  
from production  
to distribution



*A Selection Of Flavours*



[sun7fruits@sun7fruits.com](mailto:sun7fruits@sun7fruits.com)  
[www.sun7fruits.fr](http://www.sun7fruits.fr)

47, rue des Antilles  
Cp 10116 – Bâtiment I2  
94538 RUNGIS – France  
Tel: +33 1 41 73 41 50  
Fax: +33 1 45 60 53 36



## Unbalanced supply distribution

The first part of the season should be considerably more heavily laden than the second. The superimposition of the production peaks from Chile, Jalisco and Colombia (which should come a bit later than in 2019-20 given the very wet August and start to September) hints at large incoming shipments from mid-November through to January. In particular, the pressure should be fairly high for small fruit, which should continue to represent a significant proportion of the Chilean and Colombian supplies. Conversely, the market should be much more open from February, with a fairly early end to a light Chilean campaign and only average harvests in the Mediterranean. The average campaign price should nonetheless register a good level.

## Mediterranean surface areas still seeing distinct expansion...

Planting is still going strong in the Mediterranean. The cultivation area expansion rate has accelerated markedly in Israel, going from approximately 1 000 ha/year in 2018 and 2019 to a still estimated figure of 1 500 ha/year in 2020. While all the country's zones are on the rise, the expansion is fastest in Western Negev. The cultivation area in this part of the country is now around 1 400 ha. Surface areas should continue to rise considerably in the coming years. As proof of this, the nursery delivery times remain around two years, despite a considerable increase in plant prices. While some growers are being cautious in view of the expansion rate of the world cultivation area, the avocado remains one of the most profitable crops (if not the most) in the Israeli horticultural sector.

In Spain, the avocado is also continuing to forge ahead. According to the information collected from growers and nursery operators, the cultivation area expansion rate remained at around 1 000 ha in 2019-20. The new production areas are continuing to expand. The cultivation area reportedly extends over approximately 800 to 1 000 ha in the Cadiz zone, with a rapid planting dynamic in particular thanks to a big project. The surface areas in the Huelva zones are around the same size, with in particular four facilities at least covering 100 to 300 ha. Surface areas in the Valencian Community are in excess of 2 000 ha, with Lamb Hass representing a large proportion of the plantations. Some limited developments have also been seen in the traditional Axarquía zone, where conversions from traditional crops are helping offset the lack of land available. The expansions seen over the past three to four years should give Spain a considerably bigger production potential in the coming campaigns.

### Avocado – World cultivation area of export varieties (Hass and Hass like, green varieties excl. West Indian)

in hectares	Cultivation area in 2020	Annual growth (2018-19 or 2019-20 average)
Michoacán	170 000	+ 1 700
Peru	41 000	+ 3 300
Jalisco	35 000	+ 3 000
Colombia	30 000	+ 6 000
Chile	26 000	-
Brazil	3 300	+ 1 000
California	18 000	- 600
<b>Latin and North America</b>	<b>323 300</b>	<b>+ 14 400</b>
<b>of which summer suppliers</b>	<b>62 300</b>	<b>+ 3 700</b>
<b>of which winter suppliers</b>	<b>261 000</b>	<b>+ 10 700</b>
Israel	12 000	+ 1 300
Spain (mainland)	15 000	+ 1 000
Morocco	5 000	+ 750
Portugal	1 500	+ 500
<b>Mediterranean</b>	<b>33 500</b>	<b>+ 3 550</b>
South Africa	19 000	+ 1 100
Kenya	7 500	+ 1 400
Tanzania	1 200	+ 400
<b>Africa</b>	<b>27 700</b>	<b>+ 2 900</b>
New Zealand	3 900	+ 50
Australia	10 500	+ 600
<b>Oceania</b>	<b>14 400</b>	<b>+ 650</b>
<b>Total</b>	<b>398 900</b>	<b>+ 21 500</b>
<b>of which summer suppliers</b>	<b>100 500</b>	<b>+ 7 200</b>
<b>of which winter suppliers</b>	<b>298 400</b>	<b>+ 14 300</b>

in green: winter suppliers | in italics: estimate | Guatemala and the Dominican Republic are missing | professional sources, official surveys





# HALLS, COMMITTED TO SUSTAINABILITY AND RESPONSIBLE FARMING

With over 130 years experience in the fresh produce industry, today Halls works with:

- 1 200 hectares of avocado orchards sourced from
- 300 000 clonal avocado trees of the best varieties per year
- sourcing from 9 packing operations in South Africa
- 22 ripening rooms in Europe
- 28 000 tonnes of avocados
- and AVOCADEMY, our training centre for tomorrow's experts.

All this so that we can bring you more transparency and traceability throughout the supply chain process.

*Passionate since 1890.*

To find out more, please contact our sales teams:

**UK:** +44 1892 723488 or eusales@hlhall.co.uk

**France:** +33 (0) 1 82 39 00 30 or ventes@hlhall.co.uk

**Netherlands:** +31 (0) 174 791 040 or info@hallsbv.nl

**Spain:** +34 (0) 653 734 003 or chris@hallsiberia.com

**Germany:** +49 (0) 1529 0044492 or info@hallsgermany.de



[www.halls.co.za](http://www.halls.co.za)

Content published by the Market News Service of CIRAD – All rights reserved

HALLS IS A MEMBER OF THE HL HALL & SONS GROUP





Morocco has just as strong a dynamic. Unfortunately, it has become very difficult to quantify. Production is issued in large part from small plots of just a few hectares which are hard to trace, established by low-tech smallholders as a way of supplementing their income, with often low-quality plant stock. Moroccan land law remains a major constraint, and limits the possibilities for developing large-scale facilities in the traditional production area situated on the coast between Kenitra and Larache. Today, there are no more than 20 to 25 facilities more than 50 ha. The Sidi Slimane zone, where a handful of plantations is measured in hundreds of hectares, remains the exception. Nonetheless the temperatures seem to be a constraint, since this new inland zone lacks the mitigating effects of the coast, in both winter and summer.

## ...and South America even more so

Jalisco's growth dynamic is not flagging. The Hass cultivation area now covers approximately 35 000 ha, with 3 000 ha planted in 2019 alone. Traditional cultivation surface areas are being converted into avocado plantations in the traditional production area of Ciudad Guzmán. Furthermore, significantly sized orchards are emerging in new zones, especially Altos Sur (districts of Barca and Lagos de Morelos in the north-east of the State, between Guadalajara and Aguascalientes) and Valles and Sierra Occidental (Ameca district to the north of Ciudad Guzmán). Production should increase greatly in the coming years, since professionals estimate that approximately one third of the stock is aged less than five years.

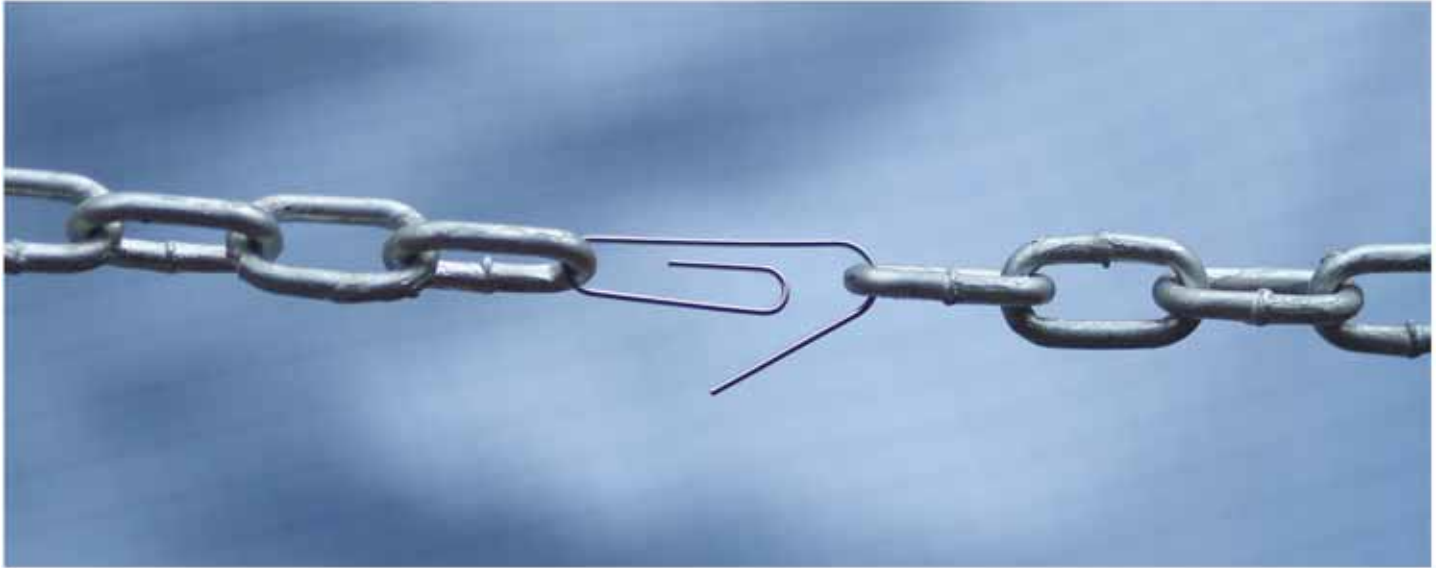


Conversely, a change in trend seems to be confirmed in Michoacán. For the second consecutive year, according to a survey by the Ministry of Agriculture (need to be able to access the export markets), the planting rate is registering only a modest level (approximately 2 200 ha in 2020 and 1 150 ha in 2019), as opposed to an average of 10 000 ha between 2015 and 2018. The downward trend is no surprise to anyone, while zones with good pedoclimatic assets are increasingly difficult to find and environmental protection laws are increasingly well respected. Conversely, the magnitude and suddenness of the fall are astounding. In any event, it is important to find out more about this trend and any long-term future, since Michoacán is chiefly responsible for expansion of the world cultivation area.

Colombia seems to be taking over from Michoacán, and is the country with the highest planting rate, by a long way. Around 10 000 ha has been planted over the past twelve to eighteen months, bringing the Colombian Hass cultivation area to approximately 30 000 ha. This massive expansion is still above all down to foreign investment. Groups specialised in the avocado in Chile, Peru and South Africa are greatly contributing to strengthening and professionalising this young industry.

Chile is the only major region supplying the European winter market whose cultivation area has stopped expanding. According to our estimates, drawn up based on land registry data and professional contacts, production surface areas are around 26 000 ha (see Chile file in this edition). They should barely see any change in the medium term, unless there is a clear change in climate conditions, and in particular the rainfall level. Expanding surface areas, perceptible in certain zones well supplied with water (San Antonio in Region V, zones with a suitable microclimate in Region VI), has for the moment only been able to offset the uprooting or mothballing of orchards, especially in the Petorca/La Ligua zone, and more recently, in certain zones of the lower Aconcagua valley ■

# Information... your weak link?



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

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

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

as well as trade associations, cargo interests and fruit importers on all continents. It is also circulated within the European Commission and the World Trade Organisation.

As well as the weekly Reefer Trends report it provides a separate online daily news service, covering developments in the global fruit, banana and logistics industries. The daily news is e-mailed direct to the desktops of several thousand subscribers worldwide.

Reefer Trends' consultancy clients include shipbuilding yards, banana majors, banks, brokers and equities analysts. Reefer Trends provides sector reports and forecasts for brokers and charterers. It has also acted as an expert witness in a chartering dispute.

**For more information on subscriptions, please contact: [info@reefertrends.com](mailto:info@reefertrends.com) or visit [www.reefertrends.com](http://www.reefertrends.com)**

reefer trends



World avocado production prospects

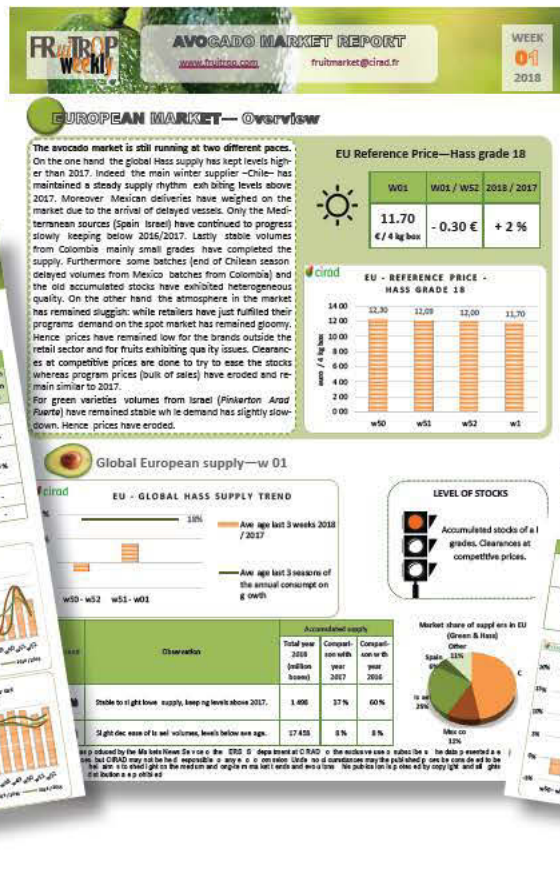
# Chile

A cutting-edge industry  
facing new challenges



Content published by the Market News Service of CIRAD – All rights reserved





# Weekly avocado market report

Comprehensive and relevant European market monitoring

- Detailed import prices for each source, variety and size
- Weekly market trends
- Forecasts
- Supply levels



Annual subscription price: €1 000 pre-VAT  
(approx. 48 editions per year)  
E-mailed out on Fridays

Contact: [info@fruitrop.com](mailto:info@fruitrop.com)

or [www.fruitrop.com/en/ciradshop/subscribe](http://www.fruitrop.com/en/ciradshop/subscribe)







**The Peru, Mexico, California and Chile files  
in the «World avocado production prospects» collection  
are the fruit of a partnership between the Hass Avocado Board  
and the CIRAD Market News Service.**

The editorial team would like to thank all the professionals who have contributed to drawing up these country profiles.

Chile file photo credits: Carolina Dawson, Eric Imbert, Comité de Palta

**Disclaimer:** the opinions expressed in the present document are solely those of the authors, and may under no circumstances be considered as stating the official position of CIRAD and the HAB. The content was drawn up in all good faith. The authors cannot however guarantee the exhaustiveness or accuracy of the information provided, nor that this information is up to date, or appropriate for specific purposes.

# The avocado in Chile

The Chilean avocado industry, which was the first to show the way to the US market, is the world number three, with export volumes of around 150 000 t per season. The Chilean industry fundamentally relies on its high adaptability. First of all, it has been able to make the most of the restrictive pedoclimatic conditions, thanks to top-flight technical know-how, setting a precedent in Latin America. It then managed to reinvent itself in commercial terms when the US market, on which it had been built, saw a drastic increase in competition. Since the last decade, it has faced major new challenges, with the appearance of a recurrent structural drought, which has really tested its structure, and strong competition gradually coming to prominence, both in its new European core market and in the USA. Its adaptability and the renowned post-harvest quality of its production are precious assets, more than ever.



World avocado production prospects - CHILE

1

Content published by the Market News Service of CIRAD - All rights reserved



# History

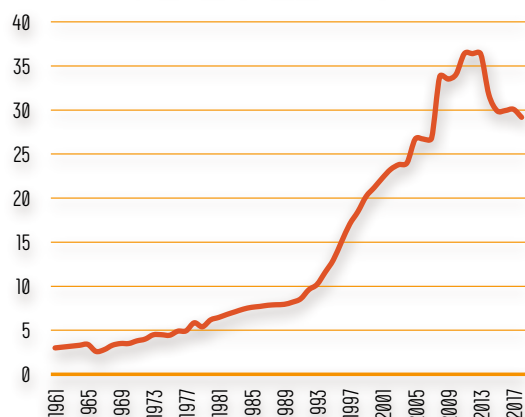
## An industry built on the US market, now with diversified outlets

The avocado is not a native plant. The introduction of this species to Chile is not documented, but probably occurred toward the early 17<sup>th</sup> Century, possibly from the Peruvian coast via the network of Franciscan missions, which made a major contribution to the distribution of the Mexican races all the way down the western part of South America. The first plantation appear to have been established toward the mid-19<sup>th</sup> Century in Aconcagua Valley. The first introductions of improved Californian plant stock began in the late 1920s, with twenty or so varieties, including Fuerte, at the initiative of the Ministry of Agriculture and then an individual. It was the latter, Don Roger Magdahl, who initiated their spread from his "Huerto California" nursery, in Quillota. He too was the first to introduce Hass, in 1944.

During the 1960s, the Chilean State implemented a policy of developing the export fruit sector (National Fruit Plan – Frei government), aimed at harnessing the country's comparative advantages, i.e. its phytosanitary assets, a Mediterranean climate and the ability to produce in the counter-season of the markets of the "rich" Northern Hemisphere countries. To do so, it relied in particular on Californian know-how in the field (cooperation agreement between universities in Chile and California). This plan, and the liberal economic policy conducted by the Pinochet military government from 1973, enabled the emergence of an export apple industry, and above all an export grape industry in the latter half of the 1970s. The avocado sector remained small-scale, centred mainly on local varieties and Fuerte (which were locally known as "palta Chilena" and "palta Californiana" respectively), with the domestic market as the sole outlet until the mid-1980s (planted area approximately 7 600 ha).



Avocado - Chile - Cultivation areas  
(in 000 hectares | sources: FAO, ODEPA)



The Avocado industry started to focus on exports at this period, motivated by the booming US market thanks to the promotion actions implemented by the California Avocado Commission. The crop seemed particularly interesting to grape producers for its high complementarity with the grape in terms of production calendar. Flows to this new market, approximately 3 000 t during the first export campaign in 1985-1986, rapidly increased. Chilean exporters and Californian operators opted to cooperate by offering, on the Chilean side, produce to make up for the absence of the local crop from mid-September to mid-December, and from the Californian side, well-established distribution networks. This market proved highly lucrative in the absence of major competitors, with Mexican imports at the time still prohibited for sanitary reasons. This was the Chilean industry's golden age. There was a boom in planting, going from 9 000 ha to more than 20 000 ha during the 1990s, with many investors taking an interest in the crop, whether or not they came from the world of agriculture (including financial groups).

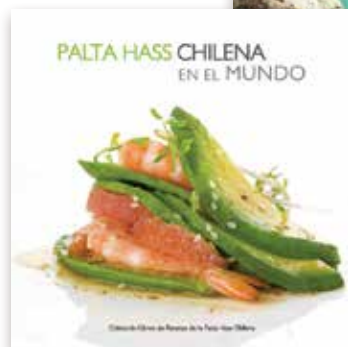
## Chile in a few figures:

- **Population:** 18.73 million inhabitants in 2018  
(source: World Bank)
- **GNI/capita:** 14 670 USD/year  
(source: World Bank, 2018)
- **Agriculture:** 3.6 % of GDP (industry 30 %)  
(source: World Bank, 2018)
- **Value of agricultural exports:** 10.2 billion USD  
(source: ODEPA, 2019)

**Main fresh fruits exported:**  
(source: ODEPA, 2019)

- **Cherry:** 1 474 million USD
- **Grape:** 1 248 million USD
- **Apple:** 620 million USD
- **Blueberry:** 560 million USD
- **Avocado:** 357 million USD

This rapid growth was accompanied by a technical revolution. The industry's centre of gravity moved inland, toward zones where land was cheap, while developing an original production system providing protection from a higher frost risk: the plantations are situated on the steep foothills of the Precordillera, at sufficient altitude to avoid the cold of the valleys while enjoying very good sunshine levels. High density started to become common practice, in particular to accelerate the return on investment. The Comité de Paltas, the body in charge of representing the industry and implementing promotions on both the international and local markets, was created in 1991. The golden opportunity that represented the US market became even more attractive from 2002-2003 with the launch of HAB's powerful promotion programme in the USA, and then a free trade agreement between the two countries (zero Customs duty, subject to quota).



The context changed radically in the 2000s, in both commercial and climate terms. Economic returns saw a distinct deterioration, with very strong Mexican competition coming to the fore, taking advantage of its ideal position to serve the US market (49 non-producing States open to Hass from Michoacán, starting from 2004). Furthermore, adverse climate conditions set in, with a major spell of frost in 2007 and the appearance that same year of a drought which would become recurrent throughout the following decade. Professionals pulled off a successful commercial conversion, by focusing on two main markets. On the one hand, local sales were increased with the support of major promotion efforts by the Comité de Paltas. On the other hand, the export flows gradually switched to the European Union. To establish the Chilean Hass on this strategic market, albeit initially less lucrative than its US counterpart, an equalisation fund was set up by the exporters themselves so that those switching to this destination could receive financial compensation. Finally, on the strength of their produce's assets in terms of post-harvest and phytosanitary quality, the professionals have managed to open up a very wide portfolio of diversification markets, both near and far, in particular Argentina and China, to name only the biggest ones. Nonetheless, the drought, which has become almost structural and set in during the 2010s, forced them into uprooting or mothballing large surface areas. The cultivation area, in excess of 35 000 ha at the beginning of this period, has stabilised at 29 000 ha according to the latest land registry figures, with some of these surface areas no longer productive.



# Location

## Structural climate constraints

The spatial distribution of the cultivation area is subject to the multiple climate constraints in place, due to the particular geography of this country. Chile comprises a strip of land 4 300 km long, i.e. extending over more than 20° in latitude, and measuring between 90 km and 440 km across at its extremes. It is bounded by natural borders such as the Atacama Desert to the north, the Andes Cordillera to the east, Patagonia to the south and the Pacific to the west. So the country has a great diversity of climates, varying not only according to latitude but also the rapid elevation in relief from west to east, with peaks of more than 6 000 m located a hundred or so kilometres from the coast. The presence at sea of the Humboldt cold current also plays a major role, limiting both the temperature level and the rainfall, in particular in the mid-north of the country.

So the avocado has been planted in zones with a Mediterranean climate, thereby limiting the frost risks, and endowed with surface or underground water resources (river valleys descending from east to west from the Cordillera). These zones are concentrated in the central part of the country over approximately 500 km between Vicuña in the north (mid-north of Region IV) and Peumo (north of Region VI), generally in the "intermediate depression" (part situated between the coastal mountain belt and the Andes Cordillera, at a modest altitude of between 300 and 850 m). The temperatures are temperate near the coast and more extreme inland. By way of example, the minimum and maximum temperatures are 1 to 2°C and up to 30°C near the sea in Valparaiso, and - 2 to - 3°C and 36 to 37°C in Santiago inland.



Avocado – Chile – Climate characteristics

Characteristics	Coastal zone	Inland zone
Number of hours where temperature is >13°C	1 000-1 300	>1 400
Humidity	high (40-90 %)	low (25-80 %)
Frost risk	low	high, outside of sloped areas
Wind	medium to strong	weak
Extreme temperatures	summer: 10-26°C winter: 2-18°C	summer: 18-33°C winter: 0-22°C
Rainfall	low	very low
Cloudiness	High in spring/ summer	none
Harvest	late	early

Professional sources







The River Aconcagua valley is the main production centre (approximately 40 % of surface areas), with plantations situated both in the mid-valley zone (Quillota, La Cruz, Ocoa) and further upstream (San Felipe, Los Andes, Putaendo). This historic production zone enjoys a good supply of high-quality water, and is renowned as one of the best in the country.

The River Maipo and Mapocho valleys are in second position (approximately 25 % of surface areas). Temperatures are fairly extreme in the Talagante/Melipilla zone, and much more temperate in the coastal part (San Antonio), though this is subject to high cloudiness. Furthermore, these two rivers have high salinity levels (in particular the Mapocho).

Region IV comes in 3<sup>rd</sup> position, with approximately 15 % of surface areas (River Elqui, Limarí and Choapa valleys). The presence of major water infrastructures on the Rivers Elqui and Limarí makes up for a very limited precipitation level and a hot climate. The La Ligua/Petorca region, previously a big player, has seen a dramatic decline for lack of sufficient irrigation water (absence of retention infrastructures, low river flow speed, with the source too low to receive snow meltwater).

Region VI reportedly makes up just under 10 % of surface areas. While this zone does have assets in terms of water availability, thanks to a more generous rainfall, the presence of the River Cachapoal and the Rapel retention dam, areas with a climate favourable for the avocado are limited, since there is a high frost risk.



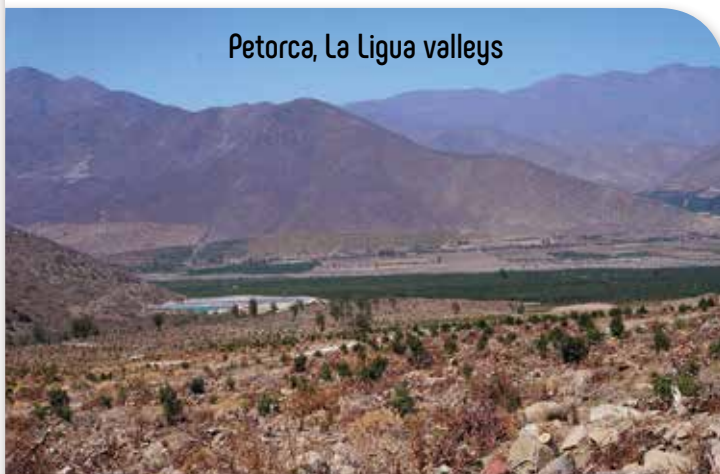


# The avocado in Chile

 Production zones  
(source: ODEPA/CIREN 2017-2018)

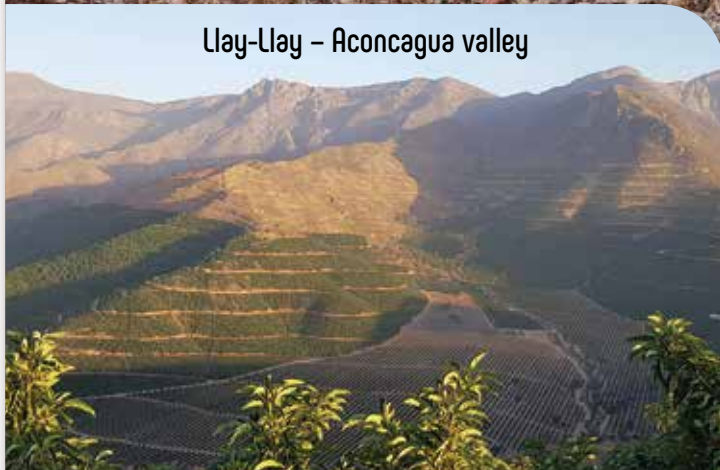
## Cultivation area of approx. 29 000 ha

Petorca, La Ligua valleys



**Elqui, Limari, Choapa valleys: 3 983 ha**  
(Region IV)

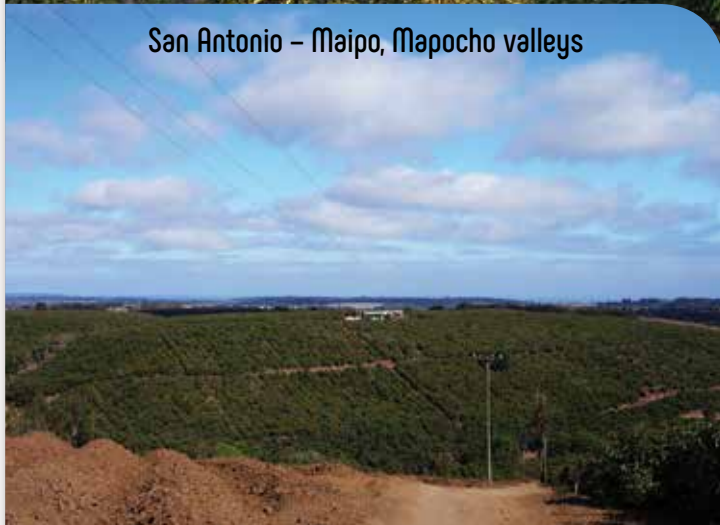
Llay-Llay – Aconcagua valley



**Petorca, La Ligua valleys: 4 807 ha**  
(Region V)

**Aconcagua valley: 11 922 ha**  
(Region V)

San Antonio – Maipo, Mapocho valleys



**Maipo, Mapocho valleys: 6 719 ha**  
(Metropolitan Region and Region V)

**Cachapoal valley: 1 169 ha**  
(Region VI)

## Avocado – Chile – Cultivation area by region

Regions	Zones	2017-18 cultivation area, land registry (ha)	2020 cultivation area, estimated (ha)	Rainfall (mm)	Koppen climate
<b>Region IV</b>		<b>3 983</b>	<b>3 400</b>	<b>80</b>	<b>Bsk/Bwk</b>
River Elqui valley	Vicuña	362	300	80	Bwk
River Limari valley	Ovalle	1 998	1 800	80	Bsk
River Choapa valley	Illapel	1 623	1 300	80	Bsk
<b>Region V</b>		<b>16 729</b>	<b>13 000</b>	<b>200/430</b>	<b>Bsk/Csc</b>
La Ligua/Petorca valley		4 807	2 500	200/250	Bsk
Aconcagua valley		11 922	10 500		
	Quillota/Marga Marga	7 743	6 000	380/430	Csc
	San Felipe/Andes	4 179	4 500	200/250	Bsk
<b>Regions V/VI</b>					
Maipo/Mapocho valley		6 835	7 500	440/460	Csa
	Talagante/Melipilla/Maipo	4 492	4 000	440	Csa
	San Antonio	2 343	3 500	450	Csa
<b>Region VI</b>		<b>1 356</b>	<b>2 500</b>		
Cachapoal valley	Peumo	1 169		960	Csb
<b>Total</b>		<b>28 903</b>	<b>26 400</b>		

Sources: CIREN, professionals

### Koppen class:

- Bwk** = desert climate, with mean temperature <18°C
- Bsk** = semi-arid climate, with mean temperature <18°C
- Csc** = warm temperate climate, with dry, short and cool summer
- Csa** = warm temperate climate, with dry and hot summer
- Csb** = warm temperate climate, with dry and temperate summer





# Production system

The production system is high-tech, in response to the fairly tough pedoclimatic constraints: cutting-edge water management, use of high density or girdling to increase productivity, etc. The training level of personnel running the orchards, and of the technical advisers, is high, especially thanks to the benchmark agricultural training provided by the country's universities, which are among the best in Latin America (Pontificia Universidad Católica de Chile, Universidad de Chile, etc.). This system also has the twofold peculiarity of the plantations being established on the slopes of the Precordillera and the high planting densities used.

## On the sometimes steep slopes of the Precordillera

Large-scale plantations are not seen on such steep slopes in any other part of the world! This original production system was dreamt up based on the Californian model, during the industry boom of the 1990s. The valley lowlands had already been harnessed or was very expensive, but some good land was still available in the parts situated further upstream, albeit on much rougher terrain. This also meant being able to address the much higher frost risk in these more inland zones. To do so, the plantations are set up half-way up the slopes, avoiding the valley bottoms exposed to frost by radiation (accumulation of heavier cold air in the low parts). Furthermore, the rows are aligned in the direction of the slope, so that this cold air can drop below the planting areas rather than remain in them. The exposed hill faces in the north, which have better exposure in the Southern Hemisphere, are favoured. As a general rule the plantations are set up on ridges, so as to have a higher land height, since these hills generally have very shallow soils. This system enables increased heat accumulation (1 300 to 1 800 hours above 13°C in orchards situated in the higher parts, as opposed to 1 000 to 1 300 hours in the valley bottoms), thereby shortening the production cycle. According to a professional estimate, 90 % of the cultivation area is planted on slopes of more than 10 %, with a gradient of up to 60°.



Girdling



## The highest planting densities in the world

With 800, 1 100 or even 1 600 plants/hectare, Chile's planting densities are staggering, and still practically unique in the world! This technical choice is able to achieve quicker returns on investment, with a small initial yield starting from two years, and then yields of 12 to 14 t/ha from the third year. It is particularly well suited to hillside planting. This system requires tree size control: the shallowness of the hill soils combined with the competition between the densely planted trees, naturally contribute to limiting their vigour. Nonetheless, pruning is essential, and use of growth regulators is common. The limited tree height means that harvesting can be done without ladders, a crucial point for personnel safety in the steeper zones. This system is only possible if sanitary pressure is very limited, as treatments are very difficult to apply due to lack of space between the rows. Significant surface areas of orchards are still managed with more conventional densities (of around 550 plants/ha). In many of these systems, growers use clonal rootstocks and girdling of one of the primary branches (depending on the tree's condition) in order to increase productivity.

## Soils: lack of porosity a limiting factor

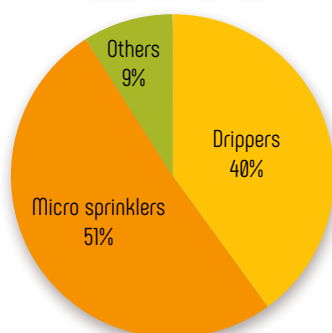
Roughly speaking, there are two types of soil in Chile. Alluvial alfisols cover the lower parts of the valleys. They are generally fairly shallow, alkaline and low in organic matter. The soils of the slopes are different. They are generally granitic or basaltic (Maicillo), clayey, low in organic matter and often stony. Their depth varies, but they are often shallow (30 cm to 1.50 m). Overall, the fine textures and lack of porosity (lack of aeration) of these soils are limiting factors. In some cases, plantings are made on ridges, to increase the depth of the shallow soils.

## Water and irrigation: a resource under strain in certain zones, but generally good quality

Use of irrigation is essential, given the insufficient rainfall level: from 450 mm to less than 100 mm from the south to the north of the avocado heartlands in a normal year. Furthermore, it is centred on the winter period from April to October, with a peak from May to August. Hence requirements vary according to the regions, with evapotranspiration ranging between 750 mm on the coast in Region VI and 2 000 mm in the semi-arid Elqui valley (Region IV). Therefore they vary within a wide range from 5 000 to 14 000 m<sup>3</sup>/ha (7 000 to 9 000 m<sup>3</sup>/ha in most of the production zones in Region V).

Given the low water availability, the irrigation systems used are very high-tech, generally in the form of micro-sprinklers coupled with soil moisture measurement systems. Good irrigation management is essential in order to prevent problems of root asphyxiation, given the low soil porosity. The water is pumped from the rivers and/or groundwater (wells of varying depth). Some big growers have equipped themselves with reservoirs. The irrigation water varies in quality, depending on the catchment area. There are major salinity problems in the Rivers Maipo and Mapocho, which pass through zones abundant in salt-rich Jurassic sedimentary-volcanic rocks further upstream. The waters from other rivers are generally of fairly good quality. However it tends to deteriorate, especially in the valley bottoms.

Avocado - Chile - Irrigation systems  
(source: CIREFI 2017-2018)



World avocado production prospects - CHILE

9





## Agricultural water: an underlying problem, which has become a societal problem in the La Ligua/Petorca region

Agricultural water availability is a recurrent problem. While nationally water is an abundant resource, some zones with a climate favourable for agriculture are short of it. First of all, the rainfall level is low, from 450 mm to less than 100 mm in most avocado zones, with the exception of Region VI. Furthermore, the rainy season falls at a period of low requirements in the vegetative cycle. The main water resource from the centre to the north of the country is water drawn from the enormous reservoir provided by snow meltwater from the Cordillera, which feeds the groundwater and rivers which flow down from it and cross the country from east to west. However, their flow speed is highly variable: rivers with a catchment area situated at altitude have more of this precious resource than those with a lower source (especially the Rivers Petorca and La Ligua). Furthermore, there is a clear lack of State investment in accumulation infrastructures, despite the structural nature of the problem and the snow resources available at altitude. Only Region IV has suitable facilities; in the other regions works projects, sometimes dating back a long time, have never been executed (though some have been approved). The drought, practically uninterrupted since the start of the 2010s, and which culminated in 2019, has further aggravated the situation.

The State's policy in terms of water management is another component of the problem. The liberal policy conducted under the Pinochet military government from the 1970s onward has led to commodification of water: usage

rights are separate from land ownership, and can be sold independently. The absence of rigorous State management has led to over-allocation and concentration of these rights, and to illegal use of the resource.

Use of water has become a controversial subject, in particular in certain poorly endowed rural or semi-urbanised zones (La Ligua/Petorca in particular), where the public water supply is a problem. In this context fingers have been pointed at agriculture, and primarily the avocado, the zone's number one crop, even though other economic sectors such as the very powerful mining industry are also big consumers. However, a policy of stricter control of use of water allocations is now in place in zones under strain, and will gradually take effect in all regions of the country (compliance with quotas, redistribution of unused rights). Furthermore, avocado industry professionals have drastically scaled back cultivation areas, by uprooting or mothballing plantations. Hence today there are only approximately 2 500 ha in production of the 8 700 ha recorded in the Petorca/La Ligua zone in the 2007 survey. Those with sufficient financial resources have upgraded their production system to reduce and optimise water use. Conversely, the State is not meeting its obligations, in failing to execute the infrastructure works required to guarantee the population a decent water supply level (water retention upstream, digging wells, etc.). Thereby it is also endangering the avocado sector, the only significant economic sector in the zone.



10

World avocado production prospects – CHILE



Content published by the Market News Service of CIRAD – All rights reserved



## An enviable phytosanitary status

Pressure from diseases and pests is very low in this “phytosanitary island” thanks on the one hand to its dry climate, and on the other hand, to the presence of natural barriers such as the Cordillera to the East, the Atacama Desert to the north, and the Pacific Ocean to the west, which safeguard it from the arrival of invasive species.

The main pests present are red spiders (*Oligonychus yothersi* and *Oligonychus punicae*), several species of thrips (*Frankliniella australis*, *Frankliniella gemina*, *Frankliniella occidentalis*) and a mealybug (*Pseudococcus maritimus*). They are generally managed using natural products (oils, sulfur, soap) and integrated pest management. Synthetic pesticides are used only in rare cases of serious infestation. The country has been free from fruit fly since 1995, a status which has opened up a number of markets, with no sanitary protocols. SAG is a State body in charge of maintaining this status (entry point controls, trapping network for detecting any infestations at an early stage, etc.).

Avocado diseases are also rare. *Phytophthora* is present in the soil, but is non-virulent in the vast majority of the production zones, with their very dry climate. Some specialists also point to the protective role played by copper, reported to be naturally present in the irrigation waters. Chile is the world's leading producer of this metal, which is the country's main economic resource. Other fungal problems are also very limited: canker (*Dothiorella* spp) and root rot (*Cylindrocarpon destructans*) are occasionally present, as well as some cases of anthracnose in the few high-rainfall years.







## Varieties and calendar: a wide calendar, thanks to great climate diversity

Introduced in the 1940s, Hass now represents nearly all surface areas planted in the country. Hass-like varieties (early such as Carmen and Maluma, or late such as Lamb), which can expand the production window, do not present any particular advantage. The Hass production calendar already covers a wide period, from early August to early April, thanks to the heterogeneous distribution of the orchards in terms of altitude and latitude. The zones situated furthest inland and at the highest altitude are the earliest, with coastal zones being the latest (maturity up to 55 days later on the coast than in the medium to high valleys). Furthermore, the orchards in the hotter zones in the north of the country are earlier than in the south.

The rest of the cultivation area comprises a wide varietal range. The main variety encountered is Edranol (5 % of surface areas), and to a lesser degree Zutano or Fuerte, primarily used as Hass pollinators. The numerous Chilean varieties, predominant in the 1970s, are now in a small minority, and aimed at the local market. The main one, Negra de la Cruz, represents barely 2 % of surface areas. Some Gem trials are in progress, though they too remain marginal.

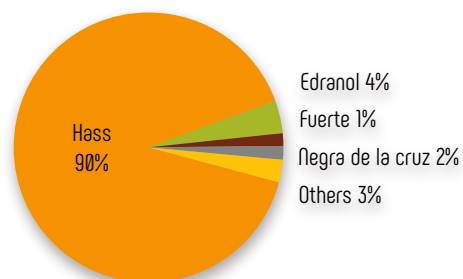
The dominant rootstock is Mexicola. However, other more salinity-resistant varieties (derived from West Indian or

Nabal races) are in common use in zones irrigated from the Rivers Maipo and Mapocho, and are reported to be on the increase too in certain plantations in the Aconcagua Valley. Use of clonal rootstocks remains fairly limited, except for replanting. The high unit cost of clonal plants (more than 10 USD/plant as opposed to 3 to 4 USD/plant for traditional plants), and their properties in terms of vigour, represent a handicap in the high-density systems commonly used in this country.

Most big growers have their own nurseries, and produce certified plants.

Avocado - Chile - Planted varieties

(source: CIREN 2017-2018)



Avocado – Chile – Production calendar by region and production zone

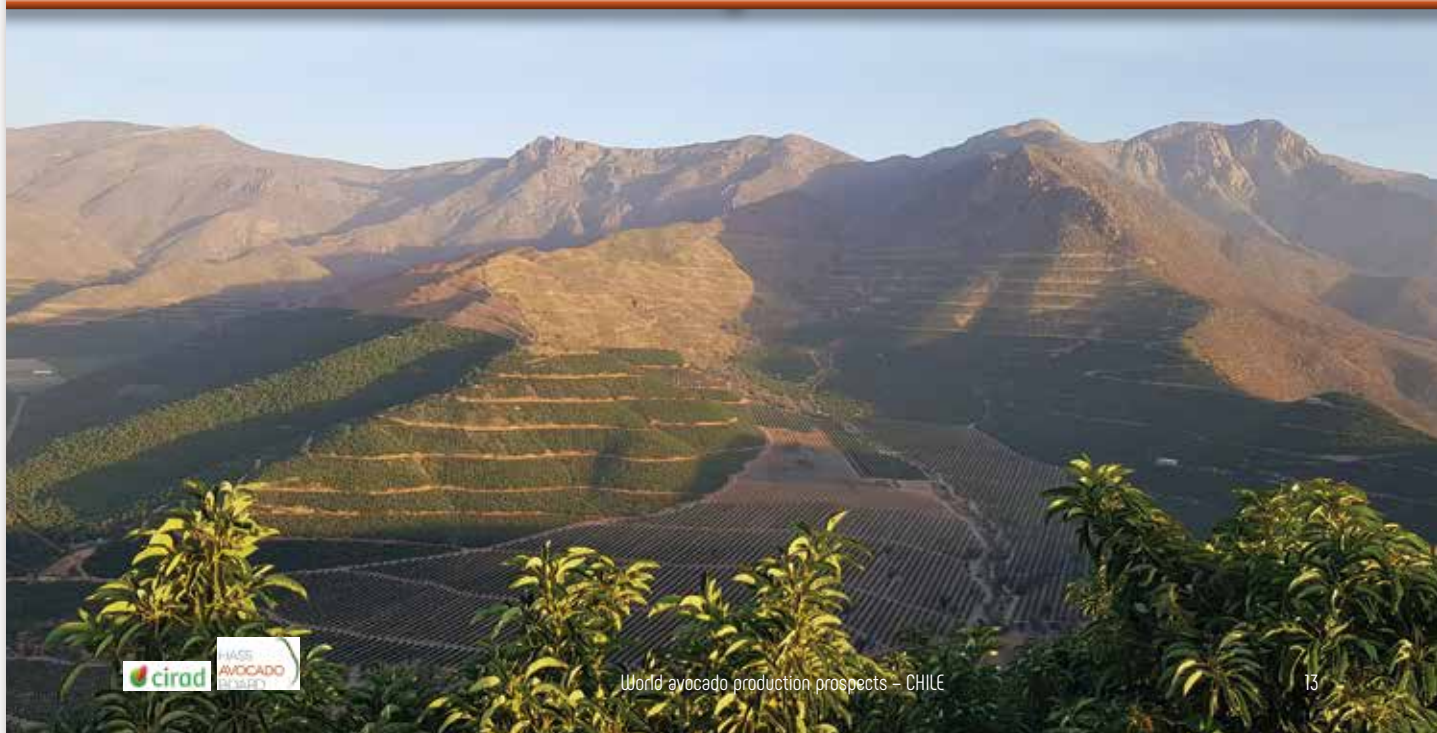
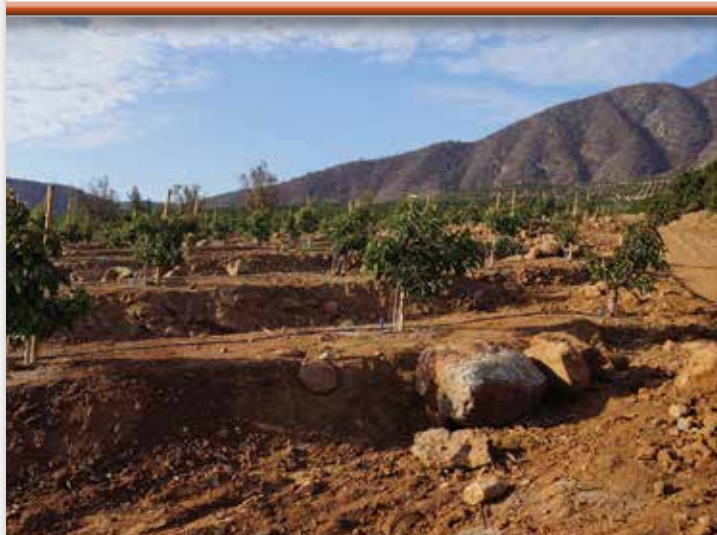
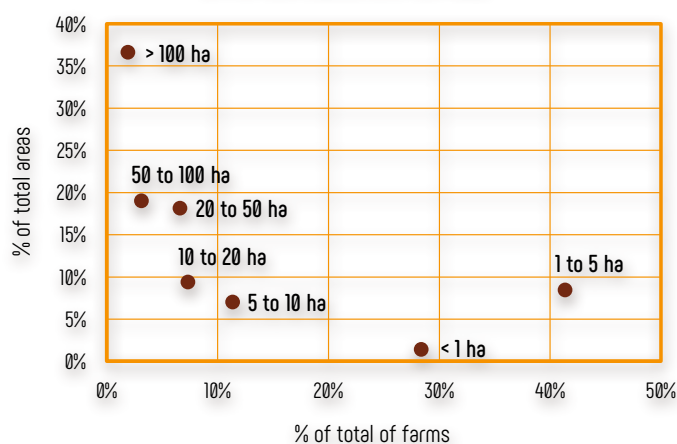
	Region	Zone	Number of hours >13°C	Sizing potential
<b>VERY EARLY</b> Harvest starts June/July	Region IV Region V	Vicuña, upper valleys of the Rivers Choapa and Illapel Petorca, Upper Aconcagua valley	> 1 800	medium to large
<b>EARLY</b> Harvest starts mid-July/August	Region IV Region V Metropolitan region	Ovalle Cabildo, Panquehue, Llay Llay Maria Pinto	1 400 to 1 700	large
<b>MID-SEASON - LATE</b> Late August	Region IV Region V Metropolitan region Region VI	Illapel, Paloma La Ligua, Quillota, Limache Melipilla Peumo, Rapel	1 100 to 1 300	medium
<b>VERY LATE</b> Late October	Region IV Region V	La Serena Santo Domingo	900 to 1 000	medium to small

According to F. Gardiazabal

## Production structure: medium to large plantations

The sector has nearly 2 700 avocado growers, according to the latest available agricultural surveys (2017-2018). The plantation size is medium to large: 75 % of the total cultivation area is concentrated in large facilities covering more than 10 ha (with 56 % of the total cultivation area within facilities covering more than 50 ha). There are many small growers with less than 5 ha (70 % of personnel), yet they represent less than 10 % of total surface areas.

Avocado - Chile - Number of farms by size  
(in % of total | source: CIREN 2017-2018)



World avocado production prospects - CHILE

13



## Yield: marked diversity

Nationally, the average yield is estimated at 11 tonnes/ha, with marked extremes varying according to the production system, and the pedoclimatic quality of the location. Low-tech small growers have low yields, of around 6 to 8 tonnes/ha, while the yields of the high-tech orchards are on average around 15 to 17 tonnes/ha, under favourable production conditions, and can reach peaks of 20 to 25 tonnes/ha. Conversely, despite good management, yields are levelling out at 10 to 13 tonnes/ha in orchards where water salinity is high. There is a marked alternate bearing effect, especially in high-density orchards and late zone orchards.



## Production costs among the highest in Latin America

Production costs are homogeneous between regions, but vary greatly according to the altitude of the orchard. They range from 8 000 to 9 000 USD/ha in the valley bottoms, and can be as high as 12 000 or even 13 000 USD/ha in the steepest zones. Hence they are considerably higher than in other South American countries such as Peru, Mexico and Colombia. Thanks to the favourable phytosanitary conditions and the free water (excluding any access rights purchases, and any desalination treatment required), the two main cost items are the energy required for pumping (approximately an additional 800 to 900 USD/ha per 100 metres altitude difference, i.e. up to 4 000 USD/ha), and labour. The cost of this latter item is rising, and is around 25 to 30 USD/day, or 440 USD/month including fringe benefits. The minimum wages set by the State are regularly revised, and are rising. The problem of labour availability, due to competition from other more lucrative economic sectors such as mining or construction, is less acute than in the past. On the one hand, personnel management has been improved with the launch of synergies with other crops with a complementary production calendar, thereby providing continuous work for the personnel, especially at the packing stations. On the other hand, use of immigrant labour has been considerable, particularly from Peru and Bolivia, since the 2010s. However, the absence of a genuine policy for receiving foreign labour raises questions over its long-term future. The biggest growers bring in contractors for harvesting, and sometimes also for pruning and irrigation systems maintenance.

# Outlets

## Production quality ensuring high commercial adaptability

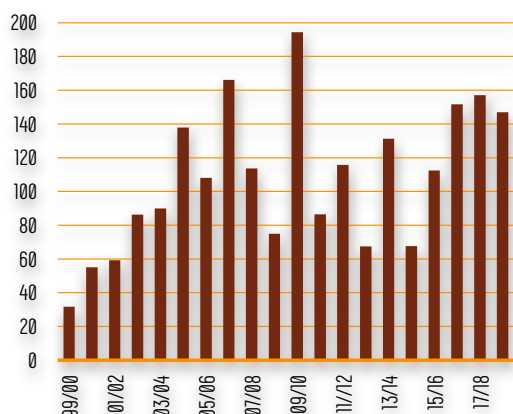
Practically all of the production is intended for fresh consumption, on the export or local markets. The industry outlet is practically non-existent since the very good sanitary level of production due to the dry climate, which helps limit sorting rejects, and fruit with cosmetic problems sells readily on the domestic market.

The export sector was built on a rationale of supplying the US market, with the Comité de Paltas and the California Growers Association operating jointly from a very early stage in terms of marketing. Volumes took off in exemplary fashion in the late 1990s, going from less than 20 000 t in 1997-1998 to nearly 200 000 t in 2009-2010. However, the dazzling rise of the Mexican competition in the USA, as well as adverse weather, altered the export landscape. Exports across all destinations, in freefall throughout the first half of the 2010s (fluctuating between 70 000 and 130 000 t per season), have climbed back to around 150 000 t in recent seasons. The European Union, initially a diversification market since it was less lucrative and harder to work (controlled atmosphere

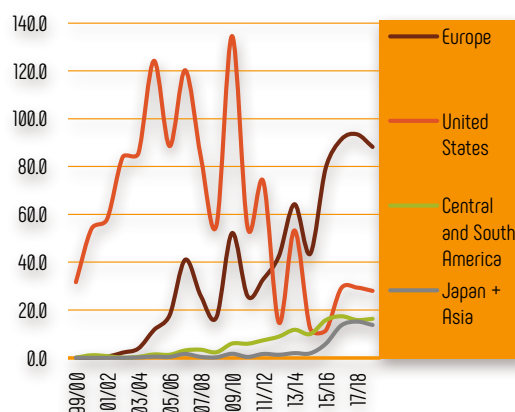
mandatory to extend the life to 45 days), has become the Chilean avocado's top destination since the 2012-2013 campaign (approximately 60 % of shipments). Chile is now the number one supplier to the EU market during the winter season, with volumes of around 90 000 t in recent seasons. The USA remains a major outlet, though volumes have topped out at just under 30 000 tonnes in recent years, sold mainly over a short period at the very beginning of the season (August-September), before Michoacán's production comes to the fore. Thanks to the country's excellent phytosanitary status, and the very high post-harvest quality of the production, Chilean exporters have developed a very wide range of customer countries, both regional and more distant destinations. Exports to neighbouring Latin American markets have increased considerably: 16 000 to 17 000 t per season, primarily aimed at Argentina, which has become the country's number three export outlet in terms of volume. Efforts in recent years have been turned to Asia, with volumes on the increase, reaching 15 000 t in 2017-2018, aimed above all at the Chinese market, which was opened up in 2014.



**Avocado - Chile - Exports**  
(in 000 tonnes | source: Chilean Customs)



**Avocado - Chile - Exports by destination**  
(in 000 tonnes | source: Chilean Customs)





The Chilean domestic market is now a major outlet for its production. The share of production aimed at local consumption is estimated at 30 to 35 %, i.e. a record for Chilean export fruits. It became of prime importance toward the 2010s, a period when Chilean growers had to face shrinking exports to the USA. The promotion campaigns conducted by the Comité de Paltas have made a big contribution to its development (in-store events, setting up a “día de la palta”, etc.). As a staple of local diet, among the favourite options as a snack (bread with avocado or cheese), the avocado is the flagship sales leader of the Chilean supermarket sector, where it is available loose or in net bags at prices which can range, for loose,



from 3 800 pesos/kg (i.e. 4.60 USD/kg) to 5 000 pesos/kg (6 USD/kg), and 2 800 pesos/kg for net bags (3.5 USD/kg). Hence this highly lucrative outlet is, at certain times of year, in direct competition with the export markets. Local production is topped up by imports from Mexico and Peru in the counter-season, taking the Chilean consumption dynamic to more than 7 kg/capita. The price elasticity of consumption remains high, as does the profitability on the retail segment: so the local market probably remains an under-used consumption pool.

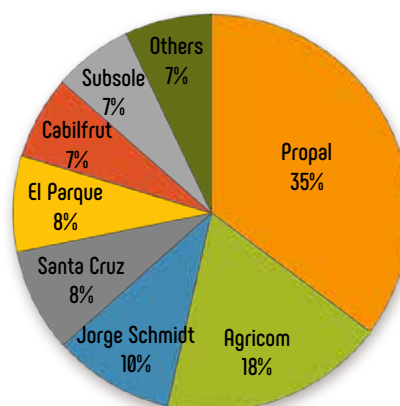


# Players

## A highly concentrated export sector

The export sector is highly concentrated, with the top five operators alone selling 80 % of volumes. Propal is by far the country's biggest operator, followed by Agricom and Jorge Schmidt, a player which has seen a dazzling rise in recent years (its volumes doubling in the space of four seasons). Further back are Santa Cruz, El Parque and Cabilfrut.

Avocado - Chile - Main exporters in 2018-2019

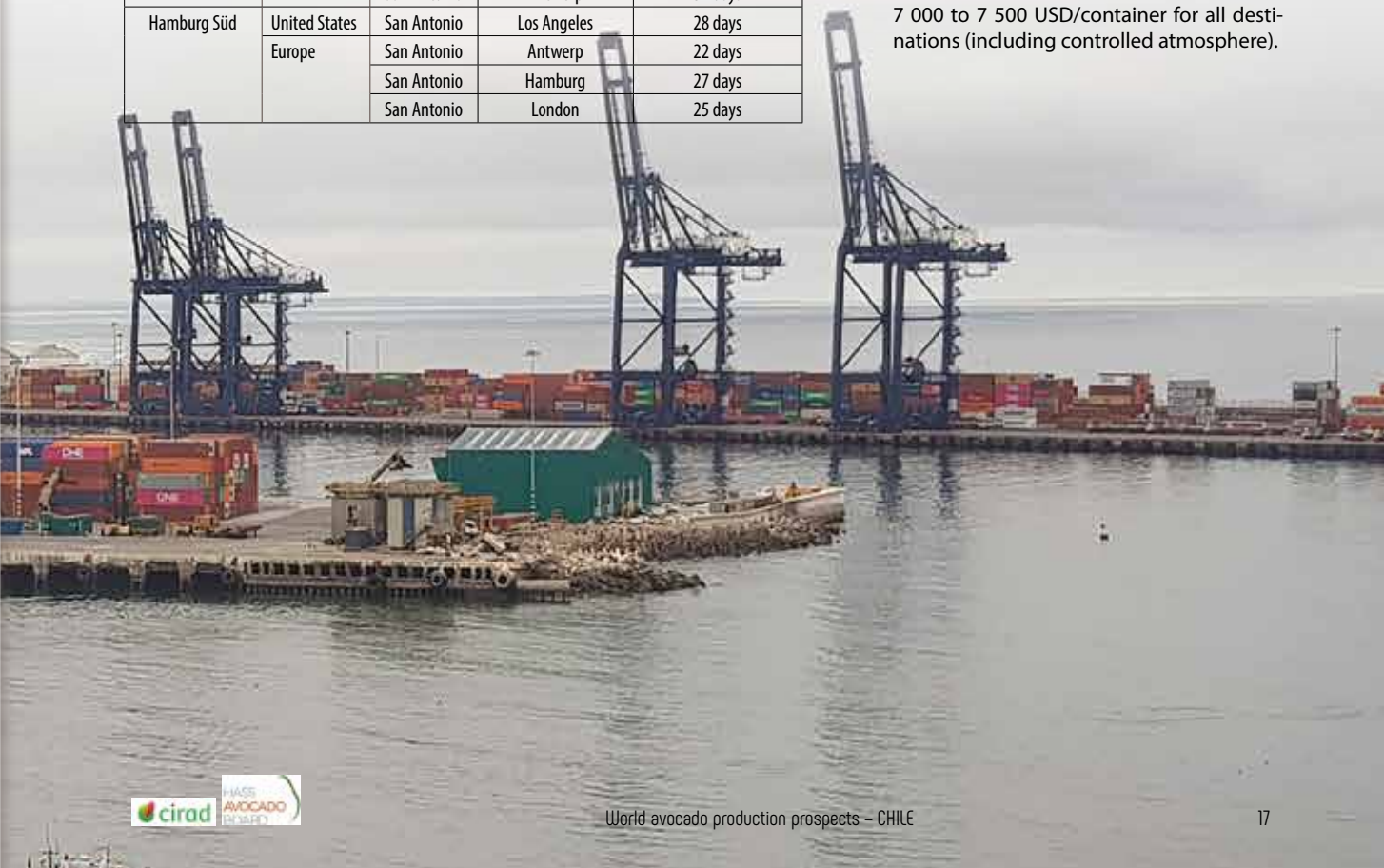


Avocado – Chile – Sea logistics

Main lines	Market	Port of departure	Port of arrival	Transit time
Maersk	Asia	San Antonio	Hong Kong	26 days
		San Antonio	Shanghai	36 days
	United States	Valparaiso	Philadelphia	17 days
	Europe	San Antonio	Antwerp	22 days
		San Antonio	Rotterdam	24 days
		San Antonio	Hamburg	27 days
Hapag-Lloyd	Asia	Valparaiso	Hong Kong	22 days <i>Cherry Express</i>
		Valparaiso	Shanghai	27 days <i>Cherry Express</i>
	Europe	San Antonio	Rotterdam	25 days
		San Antonio	Hamburg	29 days
		San Antonio	Antwerp	31 days
CMA CGM	United States	San Antonio	Ensenada (California)	-
	Europe	San Antonio	Hamburg	28 days
		San Antonio	Antwerp	31 days
Hamburg Süd	United States	San Antonio	Los Angeles	28 days
	Europe	San Antonio	Antwerp	22 days
		San Antonio	Hamburg	27 days
		San Antonio	London	25 days

## Logistics

Most merchandise is transported by road-freight to the ports of Valparaiso and San Antonio, which are situated near the production zones (no more than 2 hours by road between the production zones and the ports), and which have an SAG-USDA inspection station. Controlled atmosphere is systematically employed for shipments to all destinations. The freight cost is around 7 000 to 7 500 USD/container for all destinations (including controlled atmosphere).





# Prospects

## Methodology

We combined two approaches: one quantitative, based on using the CIREN survey data, and the other qualitative, using the information gathered from professionals. The information gathered enabled us to pinpoint and analyse the various variables influencing the evolution of cultivation areas and productivity. We then selected the most relevant hypotheses to put together an evolution scenario up to 2025. We opted for an approach based on production valleys, as the constraints vary greatly between zones, especially in terms of water availability.

## 1. Estimated evolution of surface areas

### 1.1. Cultivation area size in 2020

The initial step was to estimate the actual size of the cultivation area in 2020. While the CIREN survey data are very precise in geographic terms, they go back to 2018 for Region IV and Region VI, and to 2017 for the Metropolitan and Valparaíso regions, and some major changes have taken place in recent years. To make this estimate, we opted to extend the trend known between the last two surveys, and adjust this result according to reports from the professionals.

The results figure in the table below. They are used in the “Location” section (see page 7).

**Avocado – Chile – Cultivation area by region**

Production zones	2020 estimated cultivation area (ha)
<b>Region IV</b>	<b>3 400</b>
River Elqui valley (Vicuña)	300
River Limari valley (Ovalle)	1 800
River Choapa valley (Illapel)	1 300
<b>Region V</b>	<b>13 000</b>
La Ligua/Petorca valley	2 500
Aconcagua valley	10 500
<i>Quillota/Marga Marga</i>	6 000
<i>San Felipe/Andes</i>	4 500
<b>Regions V/VI</b>	<b>7 500</b>
Maipo/Mapocho valley	7 500
<i>Talagante/Melipilla/Maipo</i>	4 000
<i>San Antonio</i>	3 500
<b>Region VI</b>	<b>2 500</b>
<b>Total</b>	<b>26 400</b>

Sources: CIREN, professionals

### 1.2. Evolution of cultivation area over the period 2020-2025

This factor should be closely monitored in the case of Chile, despite the relative proximity of 2025. The production system, which is based on high-density planting or other techniques for increasing productivity (girdling and sometimes clonal rootstocks), makes for a rapid entry into production. Furthermore, any ongoing plantation uprooting and felling could also have an immediate impact on production. There too, we used a combined qualitative and quantitative approach. The crucial points which will govern investments are:

#### Climate context

Since 2010, Chile has gone through the worst drought ever since the meteorological data survey (“mega drought”, as it is dubbed locally). The evolution of the climate situation will go a long way to determining the dynamic of the sector in the coming years. If it eases up, the felled orchards will be reactivated, and the planting rate could pick up. However, the climate models consulted reckon on a long-term increase in water stress instead, with rainfall decreasing by approximately 15 % by 2050. Similarly, the warming phenomenon should continue, with a temperature increase of 1.5°C to 2.5°C in certain zones. Maximum summer temperatures could become problematic in certain zones (more than 30°C in all zones, except for Aconcagua Valley and San Antonio). Conversely, the frost risk appears less marked, in particular in Region VI.

Two huge water infrastructure projects are under study. They are both aimed at carrying water, abundant in the cold zones in the south of the country, to regions of high agricultural potential in the centre and north (coastal undersea aqueduct or high-altitude aqueduct running over the Cordillera). These projects are not incorporated into this study, as the consequences of their potential execution would not be felt until after the 2025 deadline.

## Increased competition and evolution of profitability

The evolution of the sector's profitability will be crucial in investment choices. While prospects of growth in world demand remain exceptional for the avocado, Chile will have to continue to face increasingly tough competition on its two main markets, namely the European Union and the USA. On the one hand, highly competitive new direct competitors are appearing in Europe (Jalisco and Colombia), while Michoacán is continuing its rise in the USA. On the other hand, the production boom from European counter-season market suppliers is tending to significantly limit the trading window for the winter origins, especially in September and during part of October. The evolution of the country's competitiveness will be crucial (production cost and productivity). The price of energy, a major cost item in the Chilean slope cultivation system, as well as labour availability in the medium term, will need to be monitored.

## Evolution of brand image

The quality of Chilean fruit is currently recognised by downstream professionals, such as importers and marketers, thanks to the excellent technical level of the growers and to the dry climate. It is a powerful differentiating asset, especially compared to more competitive origins. Conversely, recent controversies around water use have tarnished the brand image of Chile as an origin, both internationally and locally. Social pressure is high, and is contributing to curbing investment, even in zones where agricultural water availability is good.



## 2. Estimated evolution of productivity

The margins for progress appear relatively limited. In medium and large-sized plantations, the very high-tech production system already harnesses a great deal of the potential given the country's relatively restrictive pedoclimatic conditions. A larger water supply could change the hand, but it should remain restricted in the coming years. Marginal rises could come in zones where the water pressure is highest, and where certain big growers are replanting on better technical standards (clonal rootstocks, techniques to optimise water use, such as mulching, etc.). Conversely, the increasingly acute problem of salinity in other zones (Rivers Maipo and Mapocho in particular) could have a more pronounced depressive effect on yields.

Furthermore, it is also important to note that there could be a natural fall in productivity due to ageing of the stock in the next few years. The majority of the Chilean cultivation area was planted between 1992 and 2002 (1 400 ha/year on average during this period). A major need for replanting should appear in the very short term (2022-2027), with high productivity required given the country's high production costs. This is an additional challenge, which will increasingly raise the issue of investment in the Chilean avocado sector.





### 3. Overall and zonal scenario

The 2000s were a dark period for the Chilean avocado industry, with the cultivation area probably losing nearly 10 000 ha. According to our scenario, the period 2020-2025 could be a time of stabilisation. Agricultural water availability remains the main constraint, and a major brake on development. Nonetheless, the hypothesis of an ongoing large-scale reduction in surface areas seems unlikely, since professionals are seeking a balance between availability and requirements in the zones with the highest stress, even at the price of significant uprooting. Furthermore, the desire to invest is also being curbed by the steep increase in land prices, by the prospect of more uncertain economic returns in a country where production costs are high, and by social pressure, especially at local level given the water issue. At present extension programmes are limited, and concentrated in the southern zones best endowed with water. Furthermore, a significant proportion of the country's producer groups has diversified their investments in recent years, completely or partially targeting countries other than Chile, such as Peru, and then more recently Colombia, with Brazil also a potential target.

In the coming years, the country will need to face an additional challenge. The majority of the Chilean cultivation area was planted between 1992 and 2002 (1 400 ha/year on average during this period). If we assume a natural productivity fall after 30-35 years, and an economic balance based on a good yield level, given the country's relatively high production costs, a major replanting requirement should appear in the very short term (2022-2027).

To face these challenges, increasing productivity and maintaining an excellent quality level will remain crucial lines of work. Chilean professionals will also continue to be able to count on their adaptability to new climate or commercial realities, which they have demonstrated in the past.



#### Region IV

The climate is semi-arid, or even desert, but it is the country's only region equipped with large-scale waterworks in some zones. Hence we opted for a scenario of stability in the River Elqui valley (La Laguna and Puclaro dams – retention capacity 240 million m<sup>3</sup>) and River Limari valley (La Paloma, Cogoti and Recoleta dams – retention capacity 1 000 million m<sup>3</sup>). Conversely, we have reckoned on ongoing shrinkage of the production zones situated on the River Choapa, because of a higher water pressure (two dams in place, but a much more limited retention capacity).

#### La Ligua and Petorca valleys

There is major pressure on the water resource, and growers have had to accept uprooting and mothballing of approximately 6 000 ha in recent years (approximately 70 % of the cultivation area). We opted for a scenario of stability, since the surface areas currently in cultivation are seemingly in balance with water availability. Furthermore, we assume that productivity could increase slightly thanks to the new production systems which can optimise water use set up by some large-scale players (using clonal rootstocks, techniques for saving more water, such as mulching, etc.).

#### Aconcagua valley

This zone, the historic heartland of the Chilean avocado industry, enjoys very good pedoclimatic conditions for the crop. We opted to extend the trends from recent years, i.e. a slight drop in the valley bottoms (Quillota zone), offset by slight growth in the part situated further upstream and better endowed with surface water and groundwater (San Felipe). A similar scenario is adopted for yields: the slight increase in productivity arising from improved cropping practices would be cancelled out by a fall in downstream zones due to the appearance of salinity problems.

#### Maipo and Mapocho valleys

We opted to extend the slight downward trend in surface areas in the Melipilla and Maipo zones, where tension on the water resource is on the increase. Conversely, the increasing problem of water salinity, already high, has led us to assume a fall in productivity. Conversely, growth could continue in the San Antonio zone, where the water issue has less impact. Nonetheless the planting rate could slow down. Salinity is another issue that could affect this zone's yield, although it remains considerably lower than in zones situated further upstream.

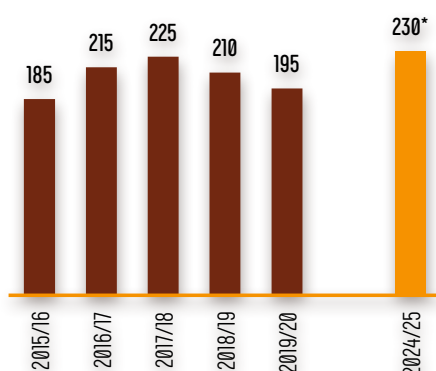
#### Region VI

The dynamic should remain strong. However, while the zone has major assets in terms of agricultural water availability, it is also subject to much more intense frost risks. So growth will remain restrained in zones with the necessary microclimate, taking into account the constraints relating to biodiversity protection (Peumo, Pichidegua, La Estrella and Las Cabras in particular). This region will considerably increase the Chilean supply in the late-season slot, though with probably acute alternate bearing effects.

#### 4. Results (see table below)

According to our hypotheses, the overall extent of the cultivation area should not see much change (approximately 25 600 ha of Hass in 2025). Conversely, its centre of gravity could shift toward the slightly wetter but also cooler zones in the south. Hass production should also see little change, with around 230 000 t.

**Hass avocado - Chile - Production**  
(in 000 tonnes | sources: Comité de Palta, CIRAD\*)



**Avocado – Chile – Evolution of cultivation area by production zone (across all varieties)**

Production zones	Cultivation areas in 2020 (ha)	Past annual evolution* (ha/year)	Hypothesis for 2025		Yield** (t/ha)	2025 production (t)
			Total cultivation areas (ha)	of which young orchards (up to 48 months) (ha)		
<b>Region IV</b>	<b>3 400</b>	<b>- 320</b>	<b>2 900</b>		<b>10.5</b>	<b>30 450</b>
River Elqui valley (Vicuña)	300	- 30	300			
River Limari valley (Ovalle)	1 800	- 200	1 800			
River Choapa valley (Illapel)	1 300	- 100	800			
<b>Region V</b>	<b>13 000</b>	<b>- 220</b>	<b>13 000</b>	<b>800</b>		<b>130 900</b>
La Ligua/Petorca valley	2 500	- 270	2 500		9	22 500
Aconcagua valley	10 500	+ 50	10 500	800	10.5	108 400
Quillota/Marga Marga	6 000	- 200	5 000			
San Felipe/Andes	4 500	+ 250	5 500	800		
<b>Regions V/VI</b>	<b>7 500</b>	<b>+ 320</b>	<b>7 700</b>			<b>65 700</b>
Maipo/Mapocho valley	7 500	+ 320	7 700		9	65 700
Talagante/Melipilla/Maipo	4 000	- 130	3 200			
San Antonio	3 500	+ 450	4 500	800		
<b>Region VI</b>	<b>2 500</b>	<b>+ 300</b>	<b>4 000</b>	<b>1 200</b>	<b>10.5</b>	<b>35 700</b>
<b>Total</b>	<b>26 400</b>		<b>27 600</b>			<b>262 750</b>
			<b>of which HASS (89 %)</b>	<b>25 600</b>		<b>230 000</b>

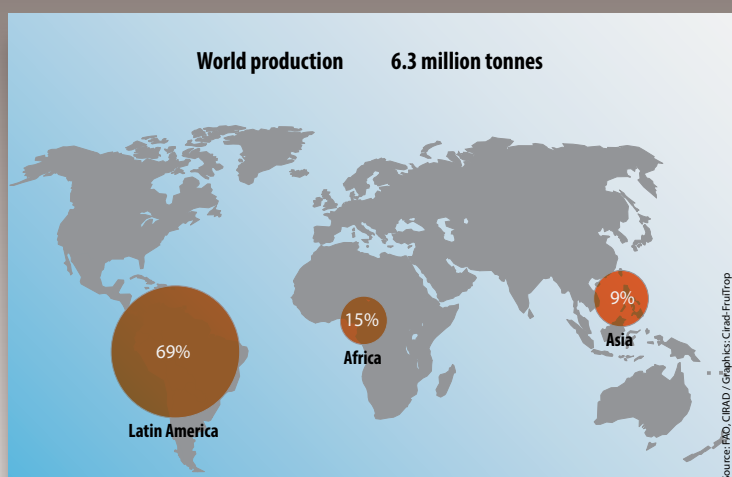
\* calculated between the last two surveys (2018/2015 or 2017/2014)

\*\* Yields of young orchards before maturity were smoothed: they correspond to 50 % of adult trees' yields





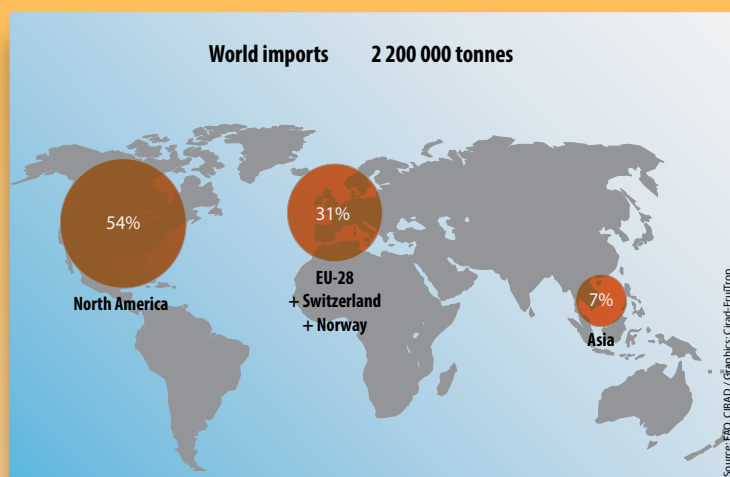
## AVOCADO - Production (2019-20)



Avocado — Top 9 producer countries	
in tonnes	2019-20 or FAO 2018-19
Mexico	2 260 000
Dominican Rep.*	644 000
Peru*	505 000
Indonesia	410 000
Colombia*	327 000
Brazil*	236 000
Kenya*	234 000
Chile	195 000
Rwanda*	162 000

Professional sources (2019-20), \* FAO (2018-19)

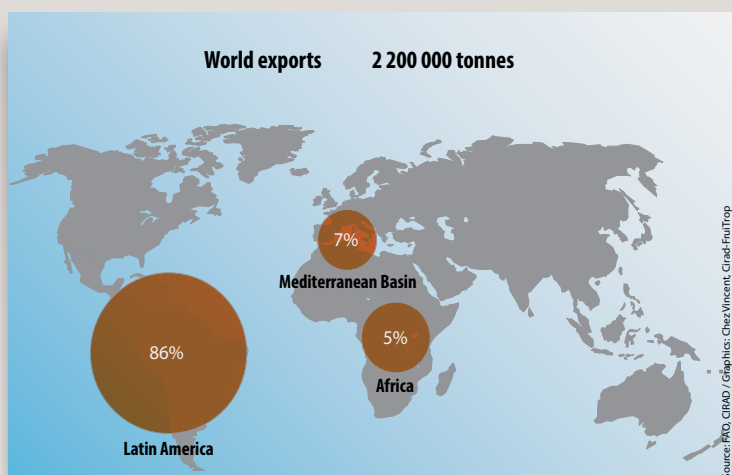
## AVOCADO - Imports (2019-20)



Avocado — Top 7 importer countries	
in tonnes	2019-20
United States	1 090 704
Netherlands	323 945
France	118 129
Spain	113 572
Canada	100 048
United Kingdom	96 839
Japan	72 514

Source: National Customs

## AVOCADO - Exports (2019-20)



Avocado — Top 6 exporter countries	
in tonnes	2019-20
Mexico	1 272 000
Peru	310 500
Chile	139 700
Kenya	60 000
Israel	54 500
Spain	53 000

Professional sources, National Customs

Content published by the Market News Service of CIRAD – All rights reserved

USA - Imports - Main supplier countries						
tonnes	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Total</b>	<b>780 412</b>	<b>917 667</b>	<b>846 414</b>	<b>982 317</b>	<b>1 058 084</b>	<b>1 090 704</b>
Mexico	686 404	853 617	764 680	862 596	917 730	963 539
Peru	64 448	46 284	31 573	64 420	81 893	85 174
Dom. Rep.	15 548	7 393	20 805	25 757	29 560	27 823
Chile	10 600	10 362	29 354	29 454	28 001	12 216

Source: USDA

Canada - Imports - Main supplier countries						
tonnes	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Total</b>	<b>56 365</b>	<b>78 621</b>	<b>75 109</b>	<b>88 088</b>	<b>95 022</b>	<b>100 048</b>
Mexico*	44 958	72 004	71 540	82 951	91 111	94 135
Peru	5 542	2 627	1 130	3 567	1 955	3 224
USA*	4 925	3 308	1 843	507	746	922
Dom. Rep.	534	483	379	629	581	752
Chile	65	3	3	20	20	48
Others	341	196	214	414	609	967

Source: COMTRADE and \*National Customs

South America - Main markets							
tonnes	2013	2014	2015	2016	2017	2018	2019
<b>Total</b>	<b>18 403</b>	<b>21 125</b>	<b>21 760</b>	<b>24 152</b>	<b>24 873</b>	<b>38 124</b>	<b>35 529</b>
Argentina	9 621	13 208	10 807	12 784	19 033	14 334	18 016
Chile	3 882	2 659	9 285	11 151	5 700	23 778	17 275
Colombia	3 904	3 128	1 130	217	133	-	238
Ecuador	996	2 130	538	-	7	12	-

Source: COMTRADE

Central America and Mexico - Main markets							
tonnes	2013	2014	2015	2016	2017	2018	2019
<b>Total</b>	<b>42 266</b>	<b>38 184</b>	<b>38 777</b>	<b>37 975</b>	<b>32 977</b>	<b>37 725</b>	<b>35 360</b>
El Salvador	12 666	12 213	12 269	12 570	12 005	14 931	13 225
Honduras	11 405	10 263	11 379	9 972	11 079	11 215	10 466
Costa Rica	13 061	12 424	11 187	9 334	7 783	7 899	7 720
Guatemala	2 923	3 211	3 942	6 081	2 110	3 680	3 949
Mexico	2 211	73	-	18	-	-	-

Source: COMTRADE

### European Union - Imports - Main supplier countries

tonnes	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Total, incl.</b>	<b>349 426</b>	<b>413 717</b>	<b>507 838</b>	<b>542 953</b>	<b>685 234</b>	<b>662 356</b>
<b>Total N. Hemisphere</b>	<b>167 741</b>	<b>220 318</b>	<b>278 607</b>	<b>305 345</b>	<b>314 625</b>	<b>372 024</b>
Chile	42 797	78 244	90 138	92 467	87 571	95 210
Mexico	12 918	45 593	36 884	60 993	47 561	71 645
Spain	50 600	37 700	55 200	48 600	57 000	57 100
Colombia (Sept./Aug.)	3 740	11 189	24 024	29 752	38 123	54 700
Israel	46 086	34 995	56 600	41 567	60 101	43 465
Morocco	7 798	7 115	9 552	21 746	11 237	32 649
Dominican Rep.	3 034	4 445	5 527	7 345	8 657	11 482
Portugal	-	-	-	1 440	3 032	2 753
Guatemala	-	-	256	300	859	2 408
Greece	765	987	424	560	484	584
<b>Total S. Hemisphere</b>	<b>181 686</b>	<b>193 399</b>	<b>229 231</b>	<b>237 608</b>	<b>370 609</b>	<b>290 368</b>
Peru	101 971	114 321	144 367	157 744	228 769	184 109
Southern Africa*	56 713	50 962	54 095	43 984	87 127	54 948
Kenya	15 604	20 728	23 444	25 425	41 525	35 530
Brazil	5 265	3 535	3 908	7 189	6 680	8 158
Tanzania	1 643	3 278	2 948	2 987	6 244	6 612
Mozambique	-	-	-	56	168	975
Argentina	43	78	133	-	96	36

\* South Africa, Zimbabwe, Swaziland / Source: Eurostat

### Other West European countries - Main markets

tonnes	2013	2014	2015	2016	2017	2018	2019
<b>Total</b>	<b>17 148</b>	<b>20 600</b>	<b>23 746</b>	<b>27 120</b>	<b>28 215</b>	<b>29 360</b>	<b>31 130</b>
Switzerland	7 915	9 516	11 376	13 823	14 694	15 528	16 090
Norway	8 787	10 496	11 673	12 411	12 422	12 779	13 960
Iceland	446	588	697	886	1 099	1 053	1 080

Source: COMTRADE

### Russia - Imports - Main supplier countries

tonnes	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Total</b>	<b>14 404</b>	<b>9 767</b>	<b>15 109</b>	<b>18 840</b>	<b>31 593</b>	<b>36 232</b>
<b>Total N. Hemis.</b>	<b>8 209</b>	<b>5 914</b>	<b>9 782</b>	<b>10 941</b>	<b>16 808</b>	<b>19 147</b>
Israel	8 123	5 814	9 614	10 234	15 216	15 055
Colombia	-	-	44	475	1 016	1 800
Mexico	-	-	-	-	-	1 512
Chile	86	99	123	232	576	780
<b>Total S. Hemis.</b>	<b>5 427</b>	<b>3 853</b>	<b>5 327</b>	<b>7 899</b>	<b>14 785</b>	<b>17 085</b>
Peru	982	1 069	1 586	2 100	3 089	7 540
Kenya	232	497	1 735	4 260	7 191	4 589
South Africa	3 994	2 197	1 902	957	3 355	2 796
Others	219	90	104	582	1 150	2 160

Source: COMTRADE

### Other East European countries - Main markets

tonnes	2013	2014	2015	2016	2017	2018	2019
<b>Total</b>	<b>2 636</b>	<b>2 749</b>	<b>2 850</b>	<b>2 324</b>	<b>3 321</b>	<b>6 627</b>	<b>8 022</b>
Ukraine	2 068	1 852	1 231	1 685	2 218	4 793	5 000
Belarus	482	744	1 441	388	770	1 501	2 417
Serbia	86	153	178	251	333	333	605

Source: COMTRADE

### Japan - Imports - Main supplier countries

tonnes	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Total</b>	<b>57 372</b>	<b>67 243</b>	<b>67 394</b>	<b>65 703</b>	<b>76 614</b>	<b>72 514</b>
Mexico	52 758	63 986	63 549	59 192	69 701	64 549
Peru	-	25	969	3 347	5 166	4 480
United States	2 124	80	1 174	2 585	1 099	2 300
New Zealand	1 704	2 467	1 527	461	118	573
Chile	786	683	175	118	512	528

Source: National Customs

### China + Hong Kong - Imports - Main supplier countries

tonnes	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Total</b>	<b>13 629</b>	<b>22 165</b>	<b>31 068</b>	<b>41 971</b>	<b>47 127</b>	<b>35 588</b>
Peru	1 154	520	2 802	6 437	17 073	13 589
Chile	1 092	5 783	13 405	15 029	13 616	11 012
Mexico	10 794	14 223	10 919	17 690	13 952	8 070
United States	243	1 052	644	1 084	1 011	1 500
Others	346	587	3 298	1 731	1 475	1 417

Source: National Customs

### South Korea - Imports - Main supplier countries

tonnes	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Total</b>	<b>1 170</b>	<b>1 658</b>	<b>3 044</b>	<b>6 145</b>	<b>13 371</b>	<b>7 238</b>
Mexico	64	391	472	1 943	4 279	3 615
United States	665	893	1 630	3 382	7 991	2 716
New Zealand	441	374	943	819	1 101	907

Source: National Customs

### Other Asian countries - Main markets

tonnes	2013	2014	2015	2016	2017	2018	2019
<b>Total</b>	<b>3 340</b>	<b>4 205</b>	<b>4 598</b>	<b>6 887</b>	<b>8 663</b>	<b>8 989</b>	<b>10 778</b>
Singapore	2 015	2 815	2 991	4 210	5 737	5 070	5 468
Malaysia	773	956	1 075	2 076	2 327	3 156	3 914
Thailand	552	434	532	601	599	763	1 396

Source: COMTRADE

### Oceania - Main markets

tonnes	2013	2014	2015	2016	2017	2018	2019
<b>Total</b>	<b>10 967</b>	<b>19 889</b>	<b>15 214</b>	<b>19 757</b>	<b>16 407</b>	<b>13 504</b>	<b>15 049</b>
Australia	10 941	19 889	15 214	19 757	16 407	13 504	15 049
New Zealand	26	-	-	-	-	-	-

Source: COMTRADE

### Persian Gulf - Main markets

tonnes	2013	2014	2015	2016	2017	2018	2019
<b>Total</b>	<b>22 604</b>	<b>26 818</b>	<b>36 400</b>	<b>39 476</b>	<b>42 676</b>	<b>45 283</b>	<b>45 151</b>
U. A. Emirates	10 077	13 250	15 841	17 000	16 555	17 777	19 081
Saudi Arabia	10 156	10 312	16 697	17 527	20 451	19 217	17 420
Qatar	598	904	1 280	1 910	2 135	4 204	4 200
Kuwait	1 247	1 601	1 791	2 084	2 341	2 680	3 000
Bahrain	382	726	791	955	1 194	1 180	1 200
Yemen	144	25	-	-	-	225	250

Source: COMTRADE

### Africa - Main markets

tonnes	2013	2014	2015	2016	2017	2018	2019
<b>Total</b>	<b>15 675</b>	<b>11 517</b>	<b>11 540</b>	<b>8 419</b>	<b>9 001</b>	<b>18 384</b>	<b>14 850</b>
Morocco	9 130	7 627	6 749	3 975	4 417	11 130	7 425
Egypt	2 914	80	462	487	500	3 309	3 500
South Africa	2 308	1 962	2 246	2 416	2 733	2 655	2 522
Burkina Faso	589	1 046	1 436	767	779	888	773
Namibia	734	802	647	774	572	402	630

Source: COMTRADE



© Carolina Dawson



# Main avocado varieties

Avocado is a dicotyledon of the genus *Persea* of the Lauraceae family. More than 200 varieties are divided between three races. The Mexican race is of little commercial interest as most of the fruits are too small. However, its agronomic qualities mean that it is widely used as rootstock or as a parent. Practically all sales of fruits of the West Indian race are on domestic markets. International trade handles mainly varieties belonging to the Guatemalan race or crosses between the Guatemalan and Mexican races.

## The Guatemalan race

### *Persea nubigena* L. Wins var. *guatemalensis*

This race probably originated not only in the highlands of Guatemala but also in the Chiapas in Mexico. The leaves are large and uniformly dark green on both faces. Although it is not as tolerant to cold as the Mexican race, it is useful for marginal cultivation zones. The fruits are roundish and have thick, very hard warty skin. The size may vary considerably but they are generally larger than fruits of the Mexican race. The seed is fairly small and almost always clings. Pulp oil content is medium at 10 to 20%. Flowering to harvest time is 8 to 10 months. It can be longer in the cold parts of California (12 to 14 months). The race is a good parent for crosses (contributing genes for small seeds). Nearly 40% of avocados belong to this race, including 'Anaheim', 'Corona', 'Sharwil' and the major commercial varieties such as 'Edranol', 'Gwen', 'Hass', 'Nabal' and 'Reed'.

## The West Indian race

### *Persea americana* Miller var. *americana*

In spite of its name, this race probably originated in Colombia. It is well suited to humid tropical regions where it is used to supply local markets. The tree has large green leaves. The fruits are elongated, usually large and weigh 400 to 900 g. The epidermis is fairly thin (0.8 to 1.5 mm) and is smooth and shiny, soft green or greenish yellow or reddish when mature. The pulp is watery with a low oil content (< 10%). The seed—often free—is large and has a more or less corrugated surface. All these characteristics make the fruits delicate. They often display pulp browning (caused by chilling injury) at the temperatures generally used for the storage and refrigerated transport of fruits of the other races (+ 6°C, + 8°C). The race is the most sensitive one to cold and aridity but the most tolerant to salinity. The flowering to harvest time is only 5 to 7 months. The West Indian race groups about 15% of avocado varieties and the best known among them are 'Peterson', 'Pollock' and 'Waldin'.

## The Mexican race

### *Persea americana* Miller var. *drymifolia* Schlecht and Cham.

This fairly hardy race is adapted to low temperatures originated in the Mexican highlands. It differs from the two other races in several botanical characteristics:

- the leaves are generally small and release a characteristic aniseed odour when crumpled;
- flowering is earlier than in the other races and the flowering to harvest time is 7 to 9 months;
- the fruits are small and elongated and rarely weigh more than 250 g. The skin is very thin and smooth.

The pulp is often fibrous and has a high oil content (> 15%). The seed is generally large and sometimes free. This race is very sensitive to salinity. In contrast, it tolerates high temperatures and comparatively low relative humidity. Furthermore, it has greater tolerance to *Phytophthora cinnamomi* than the other races. It thus forms good rootstock and its genetic potential is well exploited in hybridisation breeding programmes. Finally, its high lipid content is an interesting feature when the fruits are used for oil production. About 20% of varieties belong to this race. The best known include 'Duke', 'Gottfried', 'Mexicolo', 'Topa Topa' and 'Zutano'.

## Hybrids

A large proportion of the varieties of interest for international trade are hybrids. These are generally natural crosses and in rarer cases are the result of breeding exploiting the inter-fertility of the three races. The main selection criteria are agronomic (resistance to pests and diseases, especially *Phytophthora*, tolerance to salinity and cold, productivity, etc.) and those related to fruit quality (size, high pulp percentage, flavour, absence of fibres, oil content, etc.). 'Bacon', 'Ettinger', 'Fuerte' and 'Lula' in particular are natural Mexican x Guatemalan hybrids. Guatemalan x West Indian hybrids, mainly from Florida, include the varieties 'Ajax', 'Booth', 'Choquette', 'Collinson' and 'Simpson'. Mexican x West Indian hybrids such as 'Indian River' are very rare. Other varieties resulting from inter-race crosses are possible.

## HASS



### Guatemalan race

**Flowering type:** A  
**Fruit shape:** pyriform  
**Skin:** dark green and brown, at maturity, not very thick, warty  
**Oil content:** 18 to 20 %  
**Average weight:** 250 to 350 g  
**Seed:skin:pulp ratio:** 16:12:72 (small seed)

'Hass' has replaced 'Fuerte' as the sector standard. It is currently the most commonly planted avocado in the world. It was selected by Rudolph Hass in California in the early 1920s and registered in 1935. The tree is vigorous and highly productive. The fruits vary in shape in some production regions, ranging from pyriform to ovoid. Average fruits size is fairly small in hot regions. Keeps well on the tree. The skin turns from dark green to purplish brown at maturity. It is easy to remove from the pulp. The organoleptic qualities are excellent. Rich flavour (nutty taste) and buttery non-fibrous pulp.



## REED

### Guatemalan race

**Flowering type:** A  
**Fruit shape:** spheroid  
**Skin:** medium thickness, slightly rough, pliable  
**Oil content:** 19 to 20 %  
**Poids moyen :** 400 to 500 g  
**Seed:skin:pulp ratio:** 17:11:72

This variety of Californian origin was selected by James Reed. Registered in 1960, the patent expired in 1977. It has succeeded in conserving the qualities of its parents 'Nabal' and 'Anaheim' without their negative features. It is fairly productive and alternate bearing is not marked. Its resistance to cold is comparable to that of 'Hass'. The fruits are large and a singular round shape. They keep well on the tree. The organoleptic qualities are excellent and the buttery pulp has a slight nutty taste and does not blacken after slicing. Peeling is also easy.

## ETTINGER

### Mexican x Guatemalan hybrid

**Flowering type:** B  
**Fruit shape:** narrowly obovate  
**Skin:** bright green, fine, fairly smooth  
**Oil content:** 18 to 22 %  
**Average weight :** 250 to 350 g  
**Seed:skin:pulp ratio:** fairly large seed



This variety was bred from 'Fuerte' in Kefar Malal in Israel, where it is mainly grown. The tree is very fertile and vigorous with an erect habit. The fruits are similar to those of 'Fuerte'. The skin is susceptible to problems of corky areas and tends to adhere to the pulp. The pulp is buttery and fibreless and has good organoleptic qualities.

## PINKERTON

### Mexican x Guatemalan hybrid

**Flowering type:** A  
**Fruit shape:** pyriform  
**Skin:** dark green, rough, tough and pliable, medium thick, easy to peel  
**Oil content:** 18 to 25 %  
**Average weight:** 270 to 400 g  
**Seed:skin:pulp ratio:** 10:13:77 (small seed)



A recent variety bred in California by John Pinkerton and registered in 1975. It is probably the result of a Hass x Rincon cross. The tree is very vigorous and tolerates temperatures of -1/-2°C to 30°C. Production is good and alternate bearing is mild. The fruits may suffer from ring-neck if the tree is under conditions of stress. The organoleptic qualities of this variety are excellent (nutty taste). The pulp is smooth, buttery and fibreless.

## FUERTE

### Mexican x Guatemalan hybrid

**Flowering type:** B  
**Fruit shape:** obovate  
**Skin:** green, matt, smooth, medium thickness. Pliable and tough, it is easy to remove.  
**Oil content:** 16 to 18 %  
**Average weight:** 250 to 400 g  
**Seed:skin:pulp ratio:** 15:10:75 (large seed)



This variety was long the most commonly planted in the world and originated in Mexico (Atlixco). The tree is vigorous with fairly good frost resistance (to 4°C), but is particularly temperature-sensitive during the flowering period. Productivity is generally good in temperate zones but it displays strong alternate bearing. The fruits are easy to peel and have excellent organoleptic qualities (buttery pulp).



# Avocado post-harvest

*Post-harvest management of fruits is of prime importance. It affects both quality and yield as losses can range from 5 to 50%.*

## The special features of climacteric fruits

Climacteric fruits have special physiological characteristics. They must be harvested after reaching a sufficiently advanced stage of development and hence of maturity. It is only then that they are capable of synthesising sufficient amounts of ethylene to be able to start ripening (a strong increase in respiration that physiologists refer to as 'climacteric' marks the start of deep-seated physiological changes). Only mature fruits will display satisfactory organoleptic characteristics once they have ripened. Avocado is a singular climacteric fruit. It can only start the ripening process after it has been picked. One of the best ways of storing the fruit is therefore to leave it on the tree. Some varieties can remain on the branch for several months, depending on the season. Suitability for 'tree storage' is generally very small or non-existent for West Indian cultivars but marked for hybrids, especially for Guatemalan x Mexican crosses. Nevertheless, prolonged storage can have a negative effect on production in the following season. These physiological considerations highlight the importance of the harvest date. Several variables that depend on the variety and the producer country concerned are to be taken into consideration to judge the optimum stage of maturity. Visual appraisal, fruit weight and diameter and the number of days after flowering give useful information but this is not accurate enough. Determining the matter content—strongly correlated with the oil content—is the most commonly used method. Appraisal of the stage of maturity is completed by analysis of enzyme activity, electrical conductivity, aromatic compounds or precursors or by tasting tests when the fruits have ripened.



Photos © Eric Imbert

# Storage

## Cooling

The temperature is lowered to slow the metabolism of the fruit so that it can be stored. This slows ethylene synthesis and its effects. It is therefore sought to bring the fruits to the best temperature for storage as rapidly as possible after harvesting (ideally in less than 6 hours). The duration of cooling depends on the initial and final temperature of the fruit and on the ambient air conditions (temperature, wind velocity and relative humidity). The time necessary varies from 8 to 10 hours. It is important to halt the cooling phase 2°C before the final temperature desired to be sure not to reach temperatures that are too low and that might damage the produce.

## Refrigeration

Optimum storage temperatures vary according to the variety, the period of the season (maturity) and the storage period desired. In general, the temperature for mature avocado ranges from 5 to 12°C with atmospheric relative humidity of 85 to 95%. The more delicate end-of-season fruits are stored in the lower part of the temperature range. For 'Hass', physiologists advise maintaining fruits at 5 to 7°C at the beginning of the season and 4.5 to 5.5°C at the end. More than four weeks of storage at these temperatures is not recommended. The optimum temperature range for 'Fuerte' is 6 to 8°C but for no more than three weeks. In practice, professionals keep all the classic commercial varieties at between 5 and 6°C. Temperatures must be strictly controlled to prevent any fluctuation. Movement of air is also regulated. Heat is released during the beginning of the ripening process and this must be taken into account. Maintaining the cold chain is of crucial importance.

## Controlled atmosphere

Controlled atmospheres are widely used for long transport and can lengthen the duration of storage. Low O<sub>2</sub> levels combined with high CO<sub>2</sub> reduce respiration and ethylene production. An O<sub>2</sub> content of 2 to 5% and CO<sub>2</sub> of 3 to 10% are generally used. The main classic commercial varieties can thus be stored for 5 to 6 weeks and even longer for 'Hass'. The effects of unsuitable O<sub>2</sub> and CO<sub>2</sub> levels are described in the paragraph entitled 'Main types of post-harvest physiological deterioration' below.

## Alternative technologies for long storage

**Treatment with 1-MCP.** Application of 1-MCP (1-methylcyclopropene) is reported to limit the internal symptoms of chilling injury (dulling of the pulp, vascular browning) in fruits stored for more than four weeks. The technique is said to give good results especially for the green varieties that are less suitable than 'Hass' for long storage (with regard to the standards in force). It has been used on a proportion of the South African harvest for three years.

**Step Down Temperature.** This technique has been used in the South African avocado sector for several years to conserve fruit quality and reduce internal symptoms of chilling injury. The storage temperature is lowered in steps (1 to 2°C each week) during transport, with care taken not to descend below 3.5°C. There are procedures (temperature and duration) for the different cultivars and regions of South Africa.



Photos © Eric Imbert



# Avocado post-harvest (continuation)

## Packing

Fruits with the desired maturity index are sorted, washed and graded before packing. Each market has its own packing requirements.

<b>Avocado – United States</b> (5.67-kg box)	
Weight (g)	Size
422	14
377	16
340	18
298	20
241	24
196	30
156	35

<b>Avocado – United States</b> (11.34-kg box - 43 x 32.6 x 17.50 cm)	
Weight (g)	Size
422	28
377	32
340	36
298	40
241	48
196	60
156	70
122	84
102	96

<b>Avocado – Europe</b> (4-kg box - 35 x 28.5 x 9 cm)	
Weight (g)	Size
461-475	8
366-400	10
306-365	12
266-305	14
236-265	16
211-235	18
190-210	20
176-189	22
156-170	24
146-155	26

<b>Avocado – Japan</b> (6-kg box - 43.9 x 33.1 x 11 cm)	
Weight (g)	Size
340	18
298	20
241	24
196	30
156	35

## Ripening

The ideal temperature for ripening is 15 to 20°C. Above 25°C, ripening is irregular, unpleasant flavours appear and the risk of rot increases. This natural process can also be controlled. Treatment with ethylene (100 ppm at 20°C for 12 to 72 hours depending on the maturity of the fruit) speeds up ripening by 3 to 6 days. It is possible to obtain fruits at an even stage of ripeness in chambers in which temperature, relative humidity and ethylene content are the main parameters controlled. Nevertheless, ripening still depends on the initial stage of maturity of the fruit.

## The main precautions to be taken in shops

Avocado fruits are very sensitive to impacts and to pressing by consumers. Ripe and nearly ripe fruits must be stored at lower temperatures (1 to 6°C). Misting is not recommended.



Photos © Eric Imbert

# Main types of post-harvest physiological deterioration of avocado

## Storage-related damage

**Chilling injury.** This damage is caused by low temperatures—generally lower than 3°C—or by prolonged storage. The symptoms may appear three days after packing during storage and more often when the fruits are removed from the cold room. Two forms of chilling injury are observed. The symptom of internal chilling injury is a browning of the pulp starting at the base of the fruit and sometimes vascular browning in the same area. In 'Fuerte', this disorder takes the form of small dark spots in the pulp. The symptoms of external chilling injury are irregular black spots on the epidermis. They may appear during storage and most frequently when the fruits are removed from cold storage.

**O<sub>2</sub> deficit and excessive CO<sub>2</sub>.** Too great a decrease in the O<sub>2</sub> level (in particular to less than 1%) can cause irregular brown spotting of the epidermis that can spread to the pulp. Too high a CO<sub>2</sub> level (over 10%) can cause discoloration of the epidermis and the development of unpleasant flavours, especially when the O<sub>2</sub> level is low.

## Fungal infection in the field revealed during or after storage

The control of fungal diseases requires effective orchard management and appropriate pre-harvest treatments. Any bruising of the fruits must be avoided at the post-harvest stage, they must be refrigerated rapidly and the cold chain maintained.

**Anthraxnose.** This is the most frequent disease during storage and is caused by infection of the fruit by *Colletotrichum gloeosporioides* in the orchard and appears only during ripening. It causes serious necrosis. Ordinary small, scattered injuries develop into large circular brown spots on the epidermis. The underlying pulp blackens and the rot reaches the seed. The rate of development of this rot depends on the transport and storage temperature and above all the state of maturity of the fruits.

**Stem-end rot.** This disease is also caused by infection by a fungus, *Botryodiplodia theobromae*. Small pale brown spots appear initially in the stem zone. The rot spreads rapidly to the rest of the fruit. The pulp is then infected to the seed. Any injury in the epidermis favours infection by the pathogen.

Avocado – Post-harvest diseases caused by pathogenic fungi	
Pathogens	Diseases
<i>Alternaria</i> spp	Black rot
<i>Botryodiplodia theobromae</i>	Stem-end rot
<i>Botryosphaeria ribis</i> ( <i>Dithiorella gregaria</i> )	Stem-end rot
<i>Colletotrichum gloeosporioides</i>	Anthraxnose: Black rot
<i>Fusarium</i> spp	Stem-end rot
<i>Penicillium expansum</i>	Blue mould
<i>Pestalotiopsis perseae</i>	Brown spots
<i>Phomopsis perseae</i>	Brown rot
<i>Phytophthora citricola</i>	Small surface injuries
<i>Pseudocercospora purpurea</i>	Soft rot
<i>Rhizopus stolonifer</i>	Corky patches on epidermis
<i>Trichothecium roseum</i>	Pink rot



# Avocado post-harvest (continuation and end)

## The harvest stage in the case of climacteric fruits

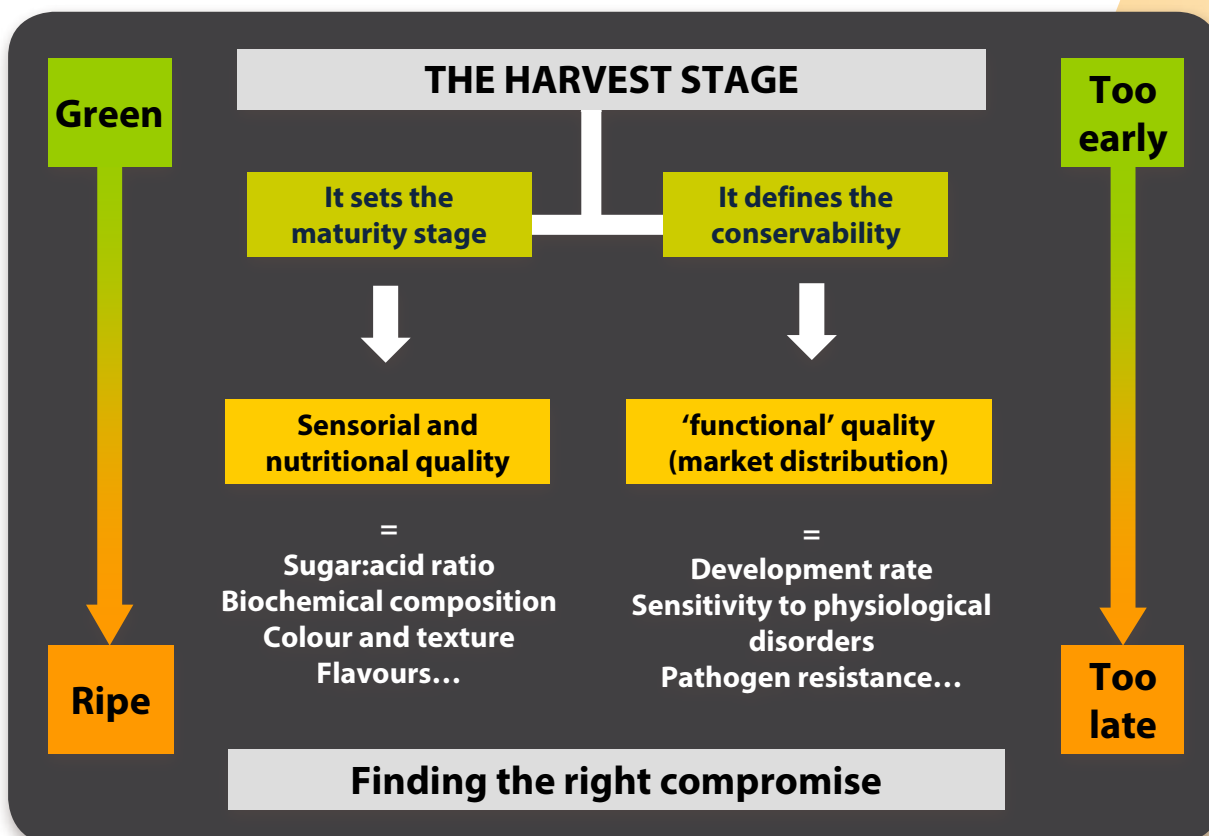
This stage is particularly important since the state of maturity of the fruit is “set” upon harvesting (see FruiTrop No.198, page 29, maturation article). The impact of the harvest stage is split into two aspects (see diagram):

- in qualitative terms, the earlier a fruit is harvested, the less taste properties it will exhibit, with a fairly low sugar content (enrichment in sugars is linked to the length of time on the plant) and a poor ability to develop flavours;
- in commercial terms, a fruit harvested at a stage too close to the fruit’s true maturity will have a lower conservability. But if the fruit is harvested too early, its ability to ripen may be insufficient, and it will not be able to go through the correct maturation development.

Importers are dependent on the compromise which may be found to reconcile taste quality and market distribution. Defining an optimum harvest stage is a real challenge, since there are not necessarily any clear visual descriptors indicating with acceptable precision the stage of maturity before maturation of climacteric fruits (known as the preclimacteric stage).

In parallel, with the markets constantly changing, the development of triggering (avocado, mango) becomes singularly complicated: how to be sure that the fruits have reached their ability to ripen? How to adapt the triggering process to the fruit’s stage of maturity, in the knowledge that the batches are heterogeneous?

There are possible alternatives for improving batch homogeneity, but this calls for a high degree of interaction between the production and distribution industries. Eventually, we will need to take into account the changes to cropping techniques on fruit physiology (conservation, metabolism of maturation). We will also need to assess the possibility of sorting fruits using non-destructive measures, to obtain homogeneous batches in order to adapt and ensure the performance of the triggering techniques.



# FR*ui*TROP

Be the first in the know, thanks to FruiTrop's new information package.

The original forecasting and review expertise available in real time on the **FruiTrop online** site, and the in-depth analyses provided in **FruiTrop Magazine** will enable you to understand the markets better than ever, to be the first to make the right decisions.

1 subscription = 2 sources of information

**FR*ui*TROP** magazine

paper and online .pdf editions

**FR*ui*TROP** online

online edition

### 6 issues per year:

January, March, May, July, September, November

### Close-up:

banana, avocado, mango, citruses, pineapple

**Forecasts, market reviews, news**

### Each month:

forecasts, market reviews, news  
on exotics and temperates

banana, avocado, mango, pineapple, litchi, citruses, grape, apple, pear, strawberry, blueberry, kiwi, stone fruits, melon, tomato, potato, sweet potato, yam, cassava, eddoo, plantain, chayote, christophine, dasheen, chilli pepper, ginger, etc.



**Annual Subscription: FruiTrop Magazine + FruiTrop online**

Content published by the Market News Service of CIRAD - All rights reserved

**= EUR 360 pre-tax (subscribe online at fruitrop.com)**





## AIR-SHIPPED MANGO FROM PERU

### Rendezvous with quality

Tasty, sweet, sugary, fiber-free, the Kent mangoes we import by air from Peru are the result of our exclusive partnerships with producers who grow fruit of exceptional quality.

Carefully matured and reconditioned on demand at our facilities in the heart of Rungis, they fully satisfy the sustained demand of consumers for fresh, tasty, healthy and ready to eat fruit.



**Greenyard Fresh France SAS**

15, boulevard du Delta / Zone Euro Delta DE1 / 94658 Rungis Cedex / France

T +33 1 49 78 20 00 / F +33 1 46 87 16 45 / [contact@greenyardfresh.fr](mailto:contact@greenyardfresh.fr)

[www.greenyardfresh.fr](http://www.greenyardfresh.fr)

Content published by the Market News Service of CIRAD – All rights reserved

for a healthier future