



2022

Country Profile: Colombia

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World avocado production prospects

Colombia

A young, explosive industry
in unique climatic conditions

Acknowledgements

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The avocado in Colombia

Still unknown on the international stage in 2010, Colombia has in the space of less than fifteen years become one of the world's top five Hass avocado exporters, with volumes in excess of 100 000 t in 2020-21 and 2021-22. The country has attracted many national and international investors since the latter half of the 2010s, thanks to powerful draw factors, such as a large reserve of unexploited land, at cheap prices until recently, a good production potential without the need for irrigation, a wide trading calendar and an ideal position to serve both the big global markets. These strong points must not be allowed to conceal the challenges due to the tough Andean topography and a unique rainfall level for Hass production, while this young industry, though making rapid headway, still needs to strengthen its technical base and the structuring of its export sector. Growth in export potential over the coming years, which is difficult to determine but in any event set to be major, is an additional challenge both in terms of infrastructure development and the commercial outlets for the fresh or processed fruit.



History

Spreading like wildfire!

As in many Latin American countries, the avocado and its cultivation are long-established in Colombia. It is in the north of the country, near the city of Santa Marta (Yaharo) that the fruit was described for the first time by the Spanish geographer Martín Fernández de Enciso, who presented it in his work "Suma de Geografía", published in Seville in 1519, "as an orange whose flesh is yellow on maturity". Colombian production, long abundant in terms of volume (more than 100 000 tonnes from the mid-1990s according to the FAO), until recently had remained very largely composed of varieties aimed at the local market: native or "Creole" types, derived from the West Indian race (Cebo, Manteca, Leche, Lorena, etc.) in the country's hot, low-lying zones, and in cooler higher-altitude zones hybrids between the West Indies and Guatemalan or Mexican races (Booth 7, Choquette, Semil, Santana, etc.). Hence the avocado is one of the fruits traditionally consumed by Colombians in abundance, and is associated with iconic dishes of the national cuisine (sancocho, bandeja paisa, mondongo, ajiaco, etc.).

Hass is a fairly new crop. While the introduction date of this variety is not known with precision, it seems to be relatively recent (very small-scale arrival of plants under the fruit diversification programme of the coffee growers' professional organisation in the late 1970s, arrival of "pirate" plants after the California World Congress in the early 1990s, etc.). In addition, the few commercial plantations established in the following decades did not find success, as this variety turning black on maturity was not really known on the local market. Hence the Hass cultivation area was estimated to cover just 1 000 ha in 2004, mainly concentrated in the Departments of Antioquia, Risaralda and Quindío.

The foundations for the exceptional progression of the Colombian industry were laid in the second half of the 2000s. The industry started to build itself a structure, with the creation of growers' associations such as APROARE in 2007 (Asociación de Productores de Aguacate de El Retiro, one of the country's main production centres), and then the National Avocado Council (CNA) in 2008, bringing together various industry players from both the private sector (nurseries, growers, etc.) and public sector (Ministry for Agriculture, research institutions, etc.).



Bandeja paisa



Colombia in a few figures:

- **Population:** 51.265 million inhabitants in 2021
(source: World Bank)
- **GDP/capita:** 6 131 USD/year
(source: World Bank, 2021)
- **Agriculture:** 7.4 % of GDP
(source: World Bank, 2021)
- **Value of agricultural exports:** 9.4 billion USD
(source: Ministerio de Agricultura, 2021)

Main agricultural export products: (source: Trademap, 2021)

- **Coffee:** 3 188 million USD
- **Flowers and flower buds:** 1 727 million USD
- **Banana, including plantain:** 1 017 million USD
- **Sugar cane:** 500 million USD
- **Palm oil:** 469 million USD
- **Avocado:** 205 million USD

The trigger for the explosion of the cultivation area was, according to the professionals, the 3rd Latin American avocado congress, held in Medellín in 2009. It not only revealed to Colombian farmers and investors the potential of a booming worldwide market: it also highlighted for the major world protagonists in this industry this country's high potential and strong assets for Hass production.

Since the beginning of the 2010s, there was a genuine boom in surface areas, for both political and economic reasons. On the one hand, the pacification of the country from 2005 enabled tens of thousands of hectares situated in the conflict zone to be restored to agricultural use. This land, available at very cheap prices (approx. US\$1 000/ha at this time for high-quality land situated in highly accessible zones), when the "green gold" boom was at its height, attracted many national and international investors.



On the other hand, the country has many agro-nomic assets for Hass production (rain-watered cultivation, good yield potential), a wide trading window (production available at various levels year-round, thanks to two blooms and several climate stages), and an excellent geographic position enabling it to serve both Europe and the USA by sea-freight, with very good transit times. Nonetheless, these strong points must not conceal the natural challenges due to the country's tropical climate and tough relief.

Surface areas went within a record time of barely twenty years from 1 000 ha to 40 000 ha today, with exports in 2020-21 touching on 100 000 tonnes, enabling Colombia to figure among the world's top five players. The avocado is now the sixth export plant product in terms of value, with just over \$200 million in 2021. The avocado industry now has a major economic and social impact in the country, providing jobs and income to rural zones which are still very fragile.



Drain

Location

A highly peculiar “tropical mountainous” climate, marked by temperate stable temperatures, but very high rainfall

The country has its own distinctive pedoclimatic identity, which deserves explanation in order to understand both the location of the cultivation area and also the highly particular cultivation conditions. Colombian has a tough terrain, with three volcanic mountain ranges reaching nearly 6 000 m, oriented from South-West to North-East (the Western, Central and Eastern Cordilleras, separated by the River Cauca and River Magdalena, respectively). Hence we can find in these mountainous formations climate stages where the altitude mitigates the high temperatures from the plains of this tropical country (temperature drop of approximately 6°C per 1 000 m in the Andean region).

The zone situated at between an altitude of 1 700 and 2 500 m is suitable for Hass cultivation, with temperatures very steady year-round, in zones with minima of 13-14°C and maxima of 23-24°C, and no frost risk at all. The very high rainfall level, typical of the Equatorial region (national average more than 2 600 mm), is another mark of distinction, with the country actually described by some climatologists as a “water castle”. The zone situated between the mountain ranges is very wet (2 200 to 3 200 mm in most zones), but is spared the extreme precipitation on the country’s Pacific and Amazonian fringes (world record of more than 10 000 mm/year in certain parts of the Pacific coast). There is no dry period, but December, January and February are generally less wet (and to a lesser degree and in certain zones, July and August). This less wet spell nonetheless remained very rainy in 2021 and 2022 (cyclical effect of the La Niña phenomenon, on top of the effects of climate change). These wet zones have abundant cloud cover, limiting insolation.



Cultivation area situated on the intermediate stage of the mountain ranges, on generally good-quality soils

So the Colombian cultivation area is primarily concentrated within the cordilleras, in the above-mentioned climate stage, between the North of Cauca Department and Antioquia Department, especially in the coffee growing zone (eje cafetero). No reliable data on its precise extension is available. Nevertheless, estimates by professionals, which tally with the projection we made from registered export surface areas (trees aged 4 years or more) and sales of plants from nurseries, indicate that it is around 40 000 ha. The country's four major production centres are the North of Valle Department, the North of Caldas, the South-East of Antioquia Department and the zone between the South-West of the same Department, North-East Risaralda and South-West Caldas. Each of these covers between 9 000 and 10 000 ha, according to professional sources. The Urrao region, in the West of Antioquia Department, also packs in very significant surface areas, of around 5 000 ha. Smaller plantations are also present in the Departments of Cauca (in the Popayán zone), Tolima and Huila.

The soils in most of the country's avocado zones are andosol, derived from the breakdown of mineral-rich ash, attesting to the volcanic nature of the Andean region. This pedological family is characterised by a high organic matter content, a low density, a high water retention capacity and an acidic pH, giving it high agronomic potential. However, the depth of the surface horizon and the clay content may represent limiting factors in some production centres.





AVOCADO – COLOMBIA MAIN PRODUCTION ZONES*

Characteristics	VALLE DEL CAUCA (North)	CALDAS (North)	ANTIOQUIA (South-East)	CALDAS (South-West) / RISARALDA (North-East) / ANTIOQUIA (South-West)	ANTIOQUIA / URRAO
Estimated surface area in 2022	9 000 ha	10 000 ha	8 750 ha	10 000 ha	5 000 ha
Main production centres	Central Cordillera: Sevilla / Caicedonia Western Cordillera: Bolívar / Trujillo / Roldanillo / Versalles / Argelia / El Dovio	Neira / Aranzazu / Aguadas / Salamina / Pacora	90 % Sonson and Abejorral San Vicente / El Peñol	Jardín / Tamesis / Caramanta / Jerico / Andes Rio Sucio / Quinchia / Guatica Anserma / Risaralda (Caldas)	Urrao
Annual rainfall	Central Cordillera: 1 600-1 700 mm Western Cordillera: 2 300-2 700 mm	2 300-2 400 mm	2 200-2 300 mm	2 800-2 900 mm	3 200 mm
Average temperatures (min. / max.)	Central Cordillera: 16-18°C / 26-27°C Western Cordillera: 14-16°C / 21-24°C	13-16°C / 21-24°C	10-12°C / 19-21°C	14-16°C / 21-24°C	13-14°C / 21-22°C
Altitude	1 400 to 2 600 m Medium slopes	1 800 to 2 700 m Steep slopes	(1 850) 2 200 to 2 400 m (2 700)	1 600 to 2 200 m	1 700 to 2 300 m Shallow to medium slopes
Soils	Mainly andosols	Mainly andosols	Mainly andosols	Mainly andosols	Mainly sedimentary soils
Production structure	Zone recently converted from coffee growing and grazing land. Mainly medium to large-sized plantations.	Zone recently converted from coffee growing and grazing land. Mainly medium to large-sized plantations.	Pioneering area, converted from subsistence minifundios. Based on smallholdings (3 to 8 ha).	Pioneering area, with considerable development in recent years. Based on small and medium growers.	Fruit growing area. Mainly medium growers (50 to 150 ha).

* Presence of orchards in Tolima, Huila, Boyaca and Cundinamarca | Professional sources



P

roduction system

Highly favourable pedoclimatic conditions for avocado cultivation, but also generating major constraints

These highly peculiar pedoclimatic conditions give the country both very strong assets for avocado production, but also very considerable constraints. Among the positives, the production potential is high. As mentioned previously, the natural soil fertility can be good, while the temperatures, temperate and steady, are highly favourable. On the other hand, the orchards can be operated without irrigation, given the very high rainfall. Finally, the presence of several climate stages and the climate peculiarities (two bloom periods) provide production practically year-round, albeit with a variable level.

Nonetheless, the absence of a water or climate stress period, greatly affects tree physiology. The blooming period is extended, to over four months at the same climate stage. So there may be high fruit heterogeneity. Similarly, there are high nutrition needs, as the avocado tree is never idle. Furthermore, the record precipitation levels for a Hass avocado production zone is a major sanitary challenge, both in terms of the crop (high fungal and parasite pressure, weed control tough) and the packhouses (high propensity for post-harvest problems). Finally, the very tough relief makes working the orchards and communications more complex.



Fruits from different blooms



Production facilities rapidly upscaling, synonymous with a higher tech level

The profile of the players present is marked both by the tough topography and the changes over time in the type of investors interested in the Hass industry. Small growers making up the initial base, who owned small to medium plantations, were joined in the 2010s by national or international operators which invested in larger-scale projects. Nonetheless, given the very rough topography of the zone suitable for Hass cultivation, the plantations of these larger-scale players do not generally exceed a few hundred hectares (200-300 ha max., excluding rare exceptions), a rather modest level in relation to the other big Latin American producer countries (Peru, Chile, etc.). To obtain a greater production potential, the production leaders have several plantations distributed in different climate zones, enabling them to expand their production calendar. The arrival of these players not only resulted in a rise in the average surface area of the plantations, but also a structural increase in the average technical level of the industry.



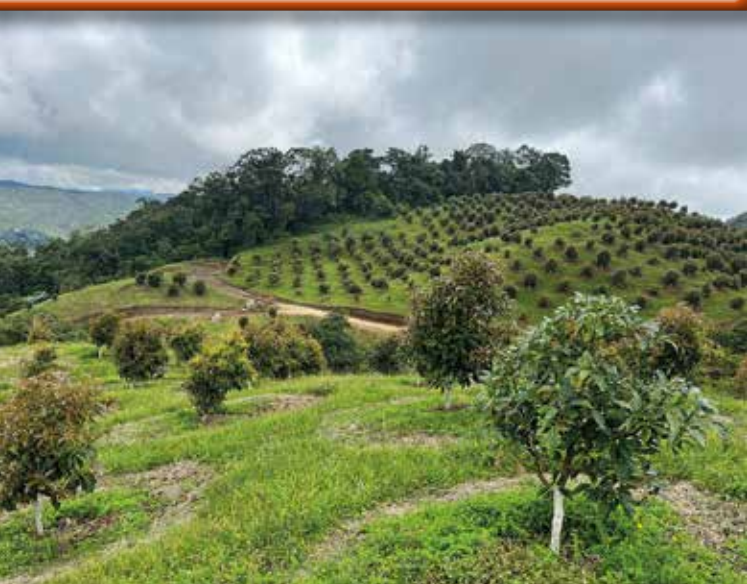
Based on cross-referencing professional sources, we can draw up a summary chart of the Colombian players. The core of the production sector is based on medium to large-scale facilities (generally from one hundred to 500-600 ha), mainly owned by local growers operating for themselves or within an association. Alongside this majority group, there are ten or so companies with 1 000 to 3 500 ha. Small growers, who sometimes only have a few hectares, represent significant surface areas. The presence of international groups (avocado specialists or investment funds) is highly significant, representing approximately 30 % of surface areas.



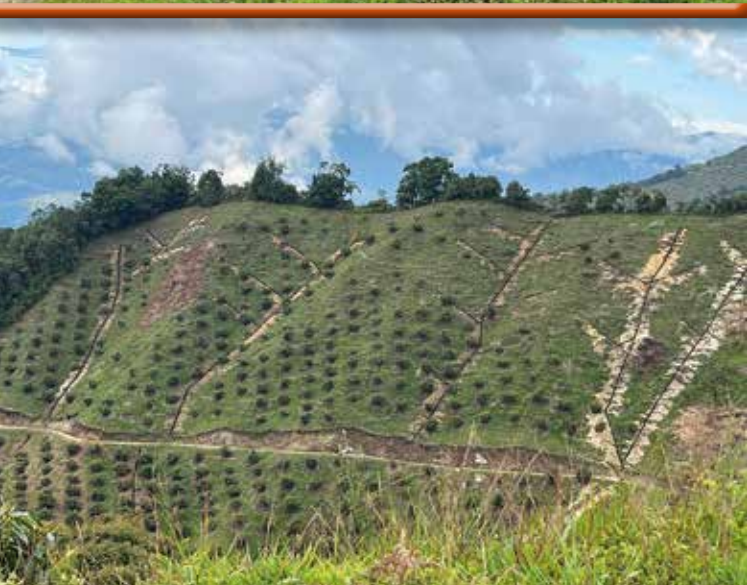


Often basic cropping practices, though rapidly developing

These highly peculiar and demanding pedoclimatic conditions call for high-level cropping practices. However, while the country has a technical base in terms of export fruit and floriculture (banana and passion fruit, etc.), Hass is a recent product for which there is not much background data. Furthermore, no production system which has been proven elsewhere in the world is transposable to the country's extremely peculiar topographical and above all climate conditions. Finally, the speed with which the industry has developed has made it impossible to identify the best technical options or obtain the best tools, in particular in terms of plant stock. Hence the cultivation system is often basic, and may sometimes seem somewhat ill-suited to the challenges. However, it is rapidly progressing, especially thanks to the entry of larger-scale players, whether national or international.



In the absence of a base of specialist experienced nurseries when the industry started up, growers used plant stock of little-known potential and sanitary quality (the Colombian nursery certification system covers primarily plant production techniques, rather than their quality). The rootstocks for the orchards situated in the low-lying zones are generally local varieties which have demonstrated good suitability (Creole rootstocks), with Hass itself often used for higher-altitude zones (an internationally infrequent combination of Hass on Hass). Clonal rootstocks currently represent only a very small fraction of the plant stock, but their use and nursery production are progressing (several players now). Furthermore, AGROSAVIA, the national agronomics research body, is working on identifying Creole rootstocks with higher potential.



Particular attention is paid to the "preservation zones" when setting up a plantation (primary forest, water catchment areas, high-altitude or "páramo" zones), with a large part of the total surface area dedicated to them. There is generally no large-scale soil preparation work before planting, aimed at addressing any compaction problems, fairly frequent in zones where the crop is taking over from decades of extensive livestock farming.

Drains



Conversely, drainage channels are installed practically as a matter of course, to limit excess wetness, though plantations on ridges are very rare. The planting density is low (generally 6x5, 6x6 or 8x4, i.e. approximately 280 to 330 trees/hectare), to favour sun exposure and aeration in these very wet and cloudy zones (improving photosynthetic efficiency, and preventing sanitary problems). In view of the precipitation, the orchards are not equipped with irrigation systems, with a few exceptions. Alongside this, fertilisation may be sub-optimal and applied manually (approximately 10-12 applications per year), despite the high needs of trees which are never idle, and the very high precipitation level and regularity, which inevitably causes leaching. Some operators are testing low-volume fertirrigation, to adjust nutrition to tree consumption, without further aggravating the problem of excess water.

Sanitary management must address the natural conditions favouring diseases and pests. The presence of two blooms makes this more complex, with the tree sometimes bearing fruit near maturity at periods when action is required to protect the flowers or young fruit of the next harvest. The main affections present are anthracnose, rust and above all root diseases, to which the avocado is highly sensitive (*Phytophthora*, asphyxia problems, etc.). Although there is little background data to draw on, these diseases can have a considerable impact and shorten the useful lifetime of the trees. There are numerous pest species present, some classified as “quarantine parasites” on certain markets. Weed control is relatively tough given a climate favourable for lush vegetation. Many plantations are tending to switch from chemical to mechanical, in particular to keep in line with changes to some certification.

Techniques aimed at improving pollination (hives, pollinating varieties) are generally not employed, since there are many endemic insects and a long bloom period. Pruning is of particular importance in this country where vegetative growth is high. However, in fact it is barely practiced, or not at all, by a significant number of growers, who do not wish to sacrifice some of the harvest, with the tree bearing fruit most of the time given the country’s peculiar climate conditions (two bloom periods, both long). Generally speaking, the orchards are worked by hand, with the steep slopes preventing a switch to mechanisation.

Harvesting is often sub-contracted, with the daily quantities harvested below average due to the steep slopes. Due to difficult access to the orchards, the fruit is initially transported in small-capacity all-terrain trucks (approximately 2 t) to a collection point, when it is moved onto medium-sized lorries (often 6 t to 10 t), after receiving sometimes fungicide treatment. In most cases, there is a long transport time to the packhouses (often 10 to 20 hours), where cooling begins, because of the intrinsically difficult Andean road network, often poor-quality in the coffee-growing zone. The propensity for post-harvest problems is fairly high. Besides a very wet climate, preventive treatments are sometimes hard to apply due to the presence of two blooms, and fruit maturity is highly heterogeneous (long bloom period).



P

roduction calendar

Year-round production

Hass avocado – Colombia – Production calendar

Zones	S	O	N	D	J	F	M	A	M	J	J	Traviesa	Main
Norte Valle												20 %	80 %
Caldas, Quindío, Risaralda												30-40 %	60-70 %
Urrao												40-45 %	55-60 %
Rest Antioquia												30 %	70 %
Tolima												50 %	50 %
Huila													

The Hass production calendar is particularly long, thanks to the various climate stages where the fruit is produced, and the presence of two blooms. The main bloom generally represents between 60% and 80 % of volumes in most zones, and the secondary bloom, locally dubbed “Traviesa”, provides the rest. For the main bloom, volumes peak from October to January, when most of the zones are at peak production.

For “Traviesa”, the harvest peak is from April to June. Hence volumes are available year-round, though in variable quantities with a trough period in February/March and August/September. This is an asset few producer countries have, except for Michoacán in Mexico.

Yield and production cost

A competitive origin in terms of yield and production cost

As already mentioned, the country has a high productivity potential. However, the technical level of the growers is highly variable and the climatology may have a big impact (difficult situation, especially in the last two seasons). Furthermore, this high wetness seems to cause an early tail-off in productivity (after 8 to 10 years) for certain orchards, even though there is not yet sufficient background data to confirm this hypothesis. Hence we can assume that the yields, smoothed over several seasons, are approximately 8 t/ha for small low-tech plantations, and 12 t/ha for the bigger facilities with more advanced production systems.

The production costs remain attractive, especially because of the rain-watered cultivation of the orchards. They can often be estimated at between \$5 500 and \$6 500/ha excluding picking, for direct costs. The harvest costs, often sub-contracted, are around \$750 for an average orchard (10 t/ha). We should also factor in the land transport to the ports, which is expensive not only due to its duration, but also to a fleet of semi-trailers which is fairly insufficient nationwide. The general worldwide trend of increasing production costs is fairly marked in Colombia, with fertilisers and phytosanitary products, prices of which have soared, representing a significant proportion of the overall budget.

Furthermore, labour costs, currently an asset with a net minimum wage of \$250/month + mandatory transport allowance, could increase. The new Administration does not seem to want to raise this amount due to the current inflationary environment. However, availability of this production factor is tightening up in rural zones, to the point of starting to pose problems in some parts of the country, while the needs of the avocado industry will see

big growth, both in terms of orchards and the packhouses, with a rapid surge in production expended. The avocado industry, already recognised for being more socially virtuous than other agricultural sectors (payment of social security, wages already above minimum with certain operators), might have to go further in order to obtain the necessary human resources. This is an important point, since the Colombian industry is relatively labour-intensive, due to the impossibility of mechanisation. Furthermore, its role should also be highlighted in terms of bringing jobs and economic income to politically and socially backward and fragile zones.



Outlets

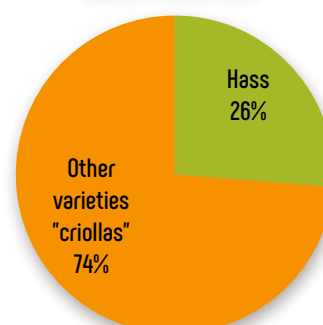
Hass, an export product in a country with high avocado consumption

A traditional fruit in Colombian cuisine, the avocado is a common part of local dishes and dietary customs. While the domestic market is a very important outlet for production, with approximately 560 000 tonnes of all varieties consumed in 2020, i.e. a consumption per capita of 11 kg, it practically only involves the traditional West Indian or Creole varieties produced in hot zones, such as "Papelillo" or "Lorena". These varieties, primarily intended for local consumption, are very popular for their large size, and are the subject of a traditional street trade, where the fruit is sold individually at major crossroads (venta de semaforo), at between 3 000 and 5 000 pesos (i.e. between €0.60 and €1.00/piece).

Hence the Hass variety, which according to ASOHOFRUCOL represents only approximately one quarter of volumes produced in Colombia, is primarily intended for export, as this variety has not yet become a clear hit with the Colombian consumer. Some supermarkets, such as "Carulla", are starting to implement promotions, but consumption remains highly focused on the traditional varieties. So Hass has a big potential for progress in such an avocado-hungry country. Nonetheless, the 20 % sorting waste from Hass production, which is not exported fresh, is primarily redirected to the processing industry. There are two or three oil plants, but most sorting waste is redirected for processing to IQF form or HPP.



Avocado - Colombia - Breakdown of production by variety in 2020: 638 591 tonnes
(source: Asohofrucol)



Certification

Behind in terms of certification

Despite the highly marked orientation of Colombian exports to the European market, where certification is becoming a condition of market access, the orchard certification remains mediocre, and not yet up to the expectations of an increasingly competitive world market. In 2021, of the 23 220 ha registered for export under ICA, just 13 000 ha were GlobalGap certified, and 4 300 ha Rainforest Alliance certified. The additional costs presented by obtaining and maintaining certification, and the absence of additional remuneration by way of recognition for the efforts made, combined with increased production costs and the poor economic returns in recent seasons (a high percentage of small fruit pushed prices down on small sized fruit, almost below production costs, and other countries of production had the same issues), seem to be discouraging a large percentage of growers from certification efforts, especially the small ones. This is proving to be a highly perilous gamble for the Colombian production industry, which could find itself penalised compared to its competitors, given the increasing requirements of European distributors in terms of certification.

The changing specifications and the regulations, especially in Europe, stipulating a progressive ban on the use of certain molecules, or reducing the tolerance thresholds of MRLs, represent additional difficulties for Colombian production, which is already highly constrained due to the country's climate characteristics.





Exports

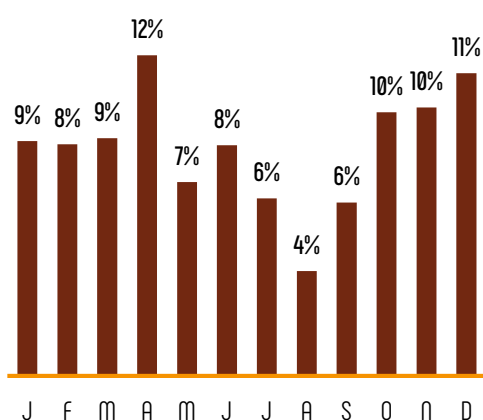
High dependence on the European market, but with assets for serving the US market

Colombia has a young export sector, at less than ten years old, with the first exports of around 400 tonnes dating back to 2012-13. However, it has seen dizzying growth, with export volumes approaching 100 000 tonnes during the 2021-22 season.

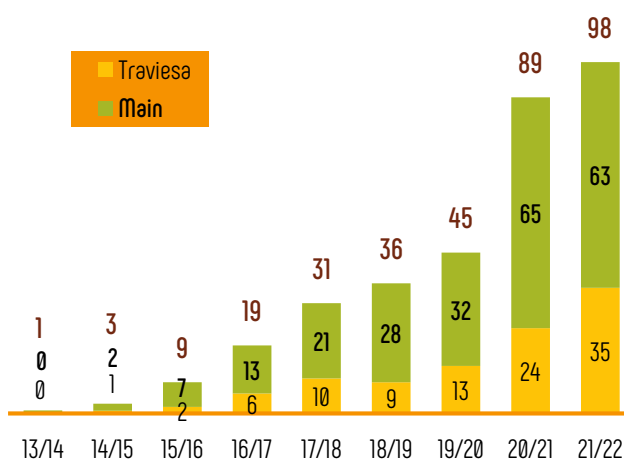
Approximately 92 % of Colombian Hass volumes are currently aimed at the European market, where the origin has become a major player in the winter season (September to March), and a top-up origin providing significant volumes during the summer season (April to August). Colombia is above all in direct competition with the other winter market suppliers, the Mediterranean origins, Chile and Mexico. However, some poor-quality fruit arrivals in a few of the countries they ship to, as well as consolidated volumes in short windows, and small sizes shipped, combined to make the country seem to be not ready for big export opportunities, especially in the EU. However, improvements are being worked on in country. The import price is valued nearly €1/box lower than the other suppliers. Furthermore, in recent years there has been a noticeable slip in the export calendar. While the bulk of Colombian volumes from the main bloom are shipped to the EU in November and December, the growing pressure from other suppliers to the European winter market, as well as the production delay due to climate problems (high rainfall these past two seasons) have shifted the shipments peak to the end of the winter season (volumes sent in February and March).

The trajectory of the Colombian avocado brand image over the past two years does not reflect the progress made by many operators in terms of post-harvest. The weather has been particularly adverse, some small exporters are still struggling to find the proper quality metrics the EU market is looking for.

Avocado - Colombia - Breakdown of monthly exports all destinations
2020-2021 average (source : Trademap)

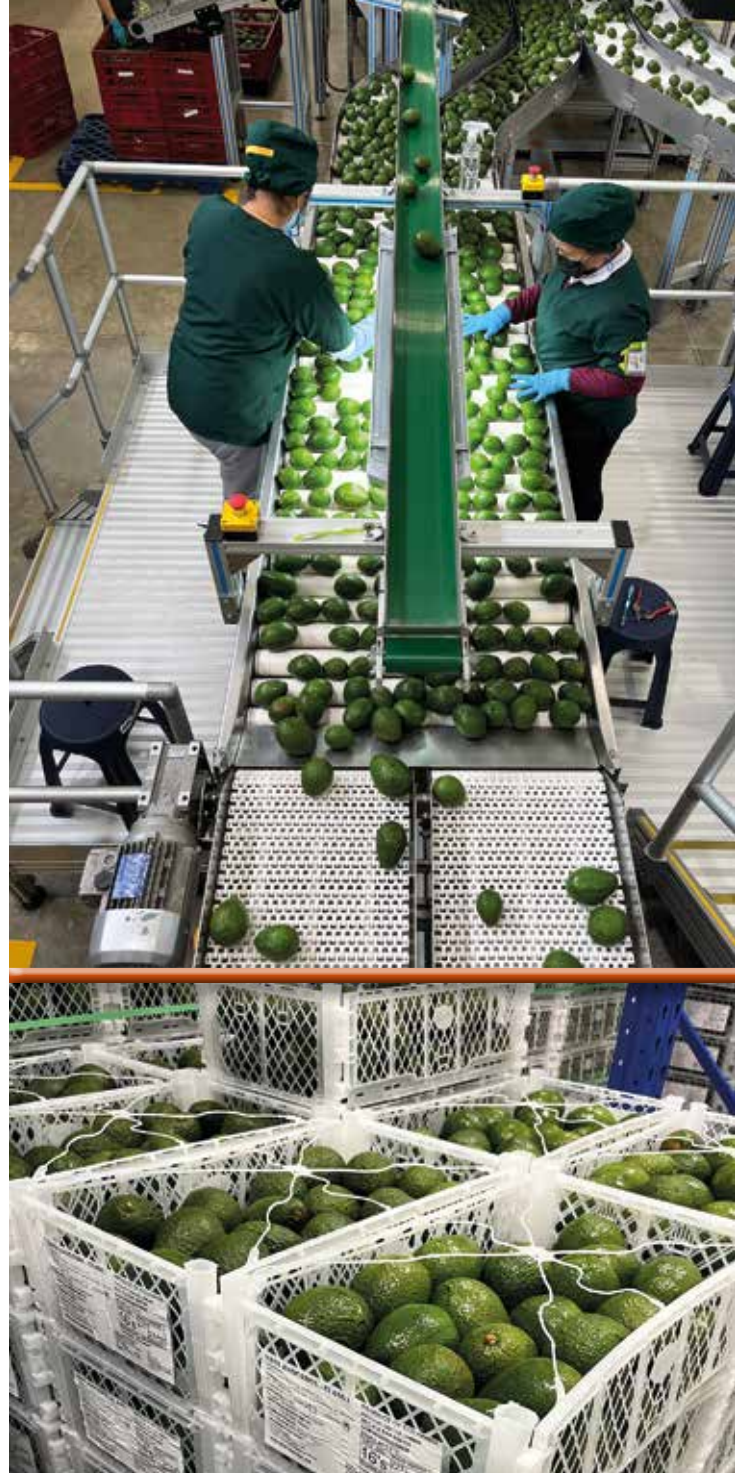


Avocado - Colombia - Total exports by bloom
Travesía = year Y-1 | Main = year Y (in 000 tonnes | source: DIAN)

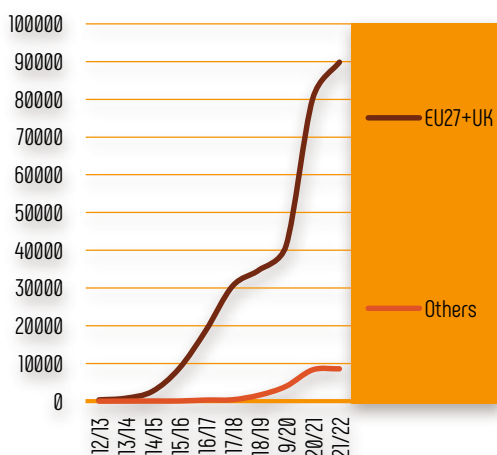


The US market, though rapidly expanding and open since 2017, currently represents only a minor outlet (just 3 000 tonnes during the 2020-21 season, i.e. approximately 3 % of exports). The protocol defined by the US sanitary authorities (APHIS), which guarantees market access for regions free from quarantine diseases, is proving hard to implement under Colombia's highly peculiar production conditions. In particular the demarcation of a one-kilometre buffer zone, which must also be disease-free, around the orchards that want to export to the USA is highly restrictive, because of the host of small growers with greatly varying technical levels. Nonetheless, this outlet remains a major opportunity for Colombian operators, and in particular for fruit from the "traviesa" bloom, whose market window coincides with a trough period in Michoacán. The USA is a nearby market (two to five days by sea for the East Coast), whose expectations in terms of post-harvest and production homogeneity are lower than in the EU-27, where ripening has become the rule. The 2022 "traviesa" campaign generated some encouraging signals (approximately 7 500 tonnes exported from early April to late August), in what admittedly is a very open market context in cyclical terms, though also more structurally, in the expectation of finding origins to reduce the Mexican hegemony.

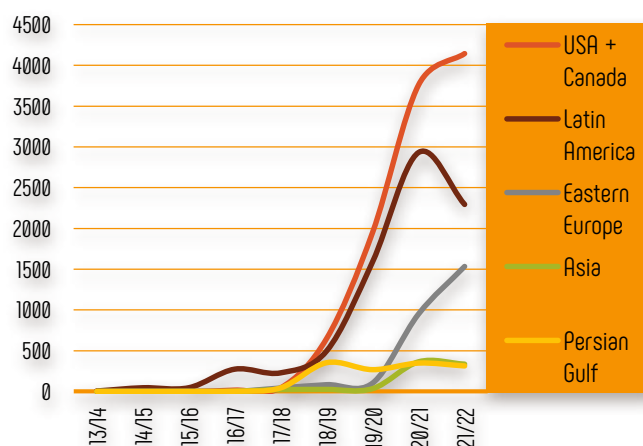
Approximately 3 % of volumes are shipped to other neighbouring Latin American destinations. The Argentinean market is open, but transport times are long and the risk of non-recovery is high. The Chilean market, open since August 2022, could contribute to boosting regional shipments. Thanks to a highly active foreign trade policy (phytosanitary protocols), new Asian outlets are now open to Colombian avocado exports such as Japan and China in 2019 and South Korea in 2021. However, volumes shipped to these destinations remain anecdotal at the moment.



Avocado - Colombia - Exports by destination
(in tonnes | source: DIAN)



Avocado - Colombia - Exports by destination
"other" in detail (in tonnes | source: DIAN)





Players

A plethora of operators in a young industry

There are approximately 25 recorded packhouses (fifteen of which high-capacity) distributed across the country, but this number is well short given the production growth. While new construction projects are now underway, an under-capacity problem could appear in the very short term, with some big growers still lacking packing facilities, while their planted areas are about to enter production. There is a margin for improvement, since the packhouses are only operating at a maximum of 2x8 h, but cooling capacity is a limiting factor.

There are various distinct packer profiles:

- **big international companies** with their own production while also purchasing from other growers. They sell on the international markets under their own brand;
- **medium-sized national or international groups** which sell their own production or contract with the brands of various producers;
- **associations** of various medium-sized growers;
- **small independent** operators.

In terms of exports, while there are more than 100 exporters in Colombia, exports are relatively concentrated: 50 % are in the hands of the top five exporters, and nearly 70 % in the hands of the top ten exporters. Nonetheless, there are a large number of pure traders handling limited quantities of entry-level, often non-certified fruit ("garage exporters").

The production and export sectors are supported and represented domestically and internationally by CORPOHASS, the Colombian Hass avocado growers' and exporters' association. Its actions are aimed at structuring this sector, providing technical support to growers and also certification support, while promoting research and training, raising the international profile of the Colombian avocado industry, with in particular the organisation of flagship events such as the "Territorio Aguacate" conference. Of the 3 000 to 4 000 players present in the country, CORPOHASS has 122 members, which represent 78 % of production by volume. It finances its activities by means of a voluntary contribution of 40 pesos per kilo. Despite its key role in organising the avocado industry, it does not receive the 1 % parafiscal tax on any exported product, which goes to ASOHOFRUCOL, Colombia's horticultural association.

Logistics

Major sea-freight assets, but a Gordian knot in terms of land transport

At all levels, logistics is one of the most critical points for the Colombian export industry. Besides the difficult road network, due to the topography, often in poor condition, and the shortage of transport capacities (especially of refrigerated trucks), an increasingly weighty problem as production surges, the port infrastructures are far from the production sites and pack-houses. It can take up to 40 hours to transport the fruit to the ports from the most remote production zones.

Approximately 60 to 70 % of avocado volumes are exported out of the port of Cartagena, followed by Santa Marta (20 %) and Turbo (10 %), the three ports on the Caribbean coast. The port of Buenaventura, which due to its location offers an interesting outlet on the Pacific Coast, remains under-exploited at present, because of its specialisation in dry goods, the absence of a cold chain and access difficulties (security). The future port of Puerto Antioquia - Tarazá, which should come into operation in 2024-2025, as well as the motorway network under construction to serve this port, should facilitate merchandise transit.

Nonetheless, Colombian ports do have two major assets. On the one hand, they have regular shipping lines and decent freight availability, Colombia being an export agricultural power, especially thanks to the presence of one of the biggest world export banana industries. On the other hand, the location of the ports on the Atlantic Seaboard enables them to serve the US East Coast and Europe without passing through the Panama Canal, which gives this origin an advantage in terms of price competitiveness over its South American competitors, Peru and Chile, hampered by the cost of the Canal toll. However, this origin has not been spared by the world freight crisis since 2020. On the one hand, the congestion of the American ports lengthens the exit time of the port. On the other hand, the price of a voyage between Colombia and Europe, which was around \$4 000/container (ctn) before 2020, is at \$6 900/ctn in 2022. To the USA, the figure has gone from \$2 500/ctn to \$5 600/ctn in 2022 (the industry does not know how long this price surge will last). This has contributed to breaking down one of the origin's main competitive advantages over its competitors, i.e. price competitiveness.

Avocado – Colombia - Sea freight

Destination	Port of arrival	Transit time
Europe	Rotterdam	13-17 days
	Algeciras	10-12 days
United States	Philadelphia	5-6 days
	Houston	9 days
	Miami	1-2 days
	Longbeach (LA)	12-13 days

Secondary road network



Tertiary road network

Prospects

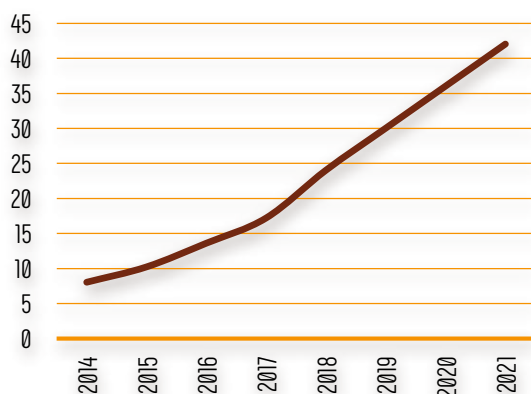
Preliminary remark

The projection proposed in this study is highly approximate. On the one hand, there is no reliable survey of the total planted area. On the other hand, Colombia has a highly peculiar climate context, with high rainfall and humidity. We lack the necessary background data, and to our knowledge there are no works based on which we could evaluate the possible consequences, such as an early fall in yields or even on the useful lifetime of the trees. In this context our ambition has to be limited to highlighting a medium-term trend. The figures presented are a potential "exportable production", i.e. the quantities produced that could be intended for export and not a projection of Colombian exports in the medium term.

Methodology

In methodological terms, we initially set out to estimate the cultivation area present in 2022 and the preceding years, factoring in the expansion forecast for the period 2022-2025. We applied a two-stage procedure to go from the raw surface area data to the production projection. The first stage consisted in calculating for each projected year a "theoretical" surface area of orchards in full production. The calculation factored in the surface of area of fully mature orchards, and young orchard surface areas gradually entering production, applying a simplifying hypothesis to estimate their progression through to maturity (first significant harvest in the 3rd cycle, with 25 % production potential, 50 % potential for the 4th cycle, 75 % for the 5th and 100 % for the 6th). In the second stage, these theoretical surface areas were then multiplied by an average full-production yield, applying hypotheses relating both increasing average technical level, but also a possible tail-off in the productivity of "old" orchards.

Hass avocado - Colombia - Evolution of planted areas
(in hectares | CIRAD estimate based on ICA data)



Results

Evaluation of cultivation area

The data from the last official survey date back to 2014. The only official figures available are from ICA-registered export orchards. The growers generally apply this approach when the young trees attain a significant harvest, in the third cycle. So the ICA figures omit orchards aged between 0 and 3 years to obtain a view of the total surface areas in place in the country. To do so, we proceeded based on the estimated plant sales from the country's nurseries in recent years, obtained from professional sources. To convert the number of plants sold into useful hectares, we used an average density of 305 trees per hectare, and a young tree mortality rate of 15 %. According to this method, the cultivation area increased by approximately 6 000 ha/year in recent years, to cover approximately 42 000 ha in total in early 2022. This figure is consistent with the impression of most of the professionals we surveyed.



Planting rate in the coming years

The data we have, which run up to mid-2022, provides us with an overview of surface areas actually in production up to mid-2025 (assuming first significant production in the 3rd production cycle). We then need to factor in a surface area expansion hypothesis for the period 2023-2027, so that we have a projection up to 2030. To do so, we applied a hypothesis of decreasing planting rate from its level over recent years. This fall is supported by two main observations. While there are huge surface areas still favourable for the crop, the plots are increasingly hard to access, and above all land costs are rising steeply. On the other hand, the world market is less attractive, with an already very considerable downward trend in rates in Europe, while world production growth should gather pace. So we opted for a hypothesis of gradual decrease, with the annual planting rate going from 6 000 ha/year of viable orchards in 2021 to 3 500 ha/year in 2025, with this level stabilising thereafter.

Estimated production

The estimated average annual yield during the projection period is complex, since the industry comprises a variety of grower profiles. Since the mid-2010s, orchard size has increased and technical command has made considerable progress, particularly toward the end of the period (higher-quality plant stock, better cropping practices). Hence the average yield has risen considerably. To reproduce this trend, we defined a typology comprising three typical grower classes:

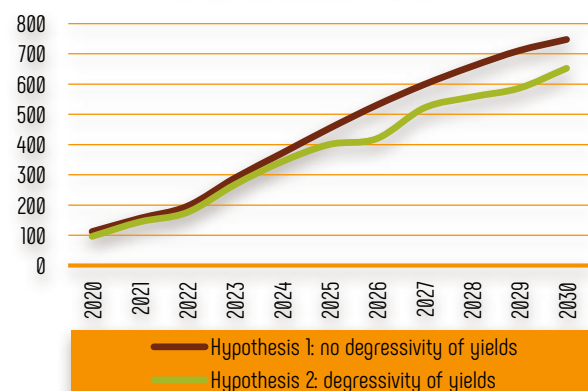
- **pioneers**, which contributed to launching the industry, and were responsible for the bulk of planting up to the mid-2010s – approximately 12 000 ha planted, with an export productivity of approximately 7 t/ha;
- **avocado professionals**, which were responsible for the bulk of planting from the mid- to late-2010s. Higher-quality plant stock and better cropping practices – approximately 14 000 ha planted, with a productivity of approximately 12 t/ha;
- **specialists**, behind the bulk of planting in recent years. Selected plant stock and expert cropping practices – approximately 18 000 ha, with a productivity of approximately 14 t/ha.

For each of these three groups, and for each year, we calculated a projected theoretical surface area of orchards in full production, based on the maturity progression hypothesis presented above. We then multiplied these surface areas by our hypothetical yields. Hence we obtained our projected exportable production, assuming no productivity fall on older orchards during the period.

We also opted to present another hypothesis, factoring in the impact of the country's extremely wet climate, and the plant stock, a tough-to-evaluate quality in particular on the pioneering orchards. Many of the growers surveyed with the oldest plantations told us of their concerns regarding a possible early decline in productivity. They have observed significant yield falls from 8 to 10 years, forcing them into severe rejuvenating pruning. They reckon that the useful tree life cannot exceed 10 to 15 years in such a peculiar climate context. There are no studies on which to base a numerical approach to these problems, the intensity of which is highly variable between zones, especially according to the rainfall and soil quality. We assumed a 15 % fall in yield from the eighth year, a 25 % fall from the tenth year and a 50 % fall from the fifteenth year. So we defined a profile of decreasing average yield, applying these downward hypotheses to the evolution for the three grower classes defined. This second hypothesis is presented along with the first by the graph below.

In both scenarios, we obtain a distinct increase in growth rate of exportable volumes, with the massive surface areas planted since the late 2010s entering production or coming into their prime. The exportable potential could exceed 350 000 t in both scenarios from 2024-2025. Thereafter, the increase would remain extremely high under hypothesis 1, and still very considerable under hypothesis 2.

Hass avocado - Colombia - Evolution trend of exportable production
(in 000 tonnes | source : CIRAD)



Limits of the study

The results presented in these two hypotheses are theoretical and come from a mathematical approach. However, some other parameters, difficult or even impossible to take into account in the projection, must be considered. They could strongly limit the expression of the exportable potential presented in the projection. Doubt remains as to the possibility of achieving the yield potentials considered in this projection. In addition, major uncertainties also remain regarding the realization of export potential, which depends on infrastructure, certifications conditioning market access, international competition, quality, etc.

Possible effects of climate change

Recent years have shown that Colombia has not been spared by the effects of climate change. The already very high rainfall level reached abnormal indeed record figures, even for a year marked by the La Niña phenomenon in the coffee growing zone. Cumulative totals for the wet months have risen, and the dry spell has practically disappeared. There were considerable consequences on avocado production, both in terms of quantities produced and sanitary quality of the production. The continuation of this trend could considerably slow down the orchard maturation, and push down the percentage of exportable fruit.

World market getting tougher

Colombia has a young industry, and not many operators were able to take advantage of the excellent market conditions in the 2010s. They have a fragile economic base, while the world market is becoming distinctly more competitive, and the economic results are reflecting this, especially in very open trading centres such as Europe. This problem could impact not only on the basic work to be done (fertilisation, pruning, etc.), but also on the possible or even necessary production investment that the still young industry seeking technical improvements could undertake (clonal plants, low-rate fertigation, etc.). It could also affect replanting, which could become a subject to address relatively quickly, if the impression among some growers is confirmed.

Hence there seem to be some major avenues of work in commercial terms, to better consolidate the origin's profitability and competitiveness. Strengthening Colombia's image on the EC market is a particularly important challenge. This point can be achieved through efforts to further spread certification. It appears critical both for maintaining strong positions on the EC market and for continuing to break into the United States and potential new markets. The professionalization of some export operators ("garage" exporters, which are pure traders with little regard for the fruit quality offered) is also a challenge. Similarly, strengthening its rooting on the US market would appear an important step. This is a natural market for Colombia, not only for its proximity, but also its more flexible quality expectations than in Europe, where the bulk of the fruit is ripened.





Major technical breakthroughs, potentially making the industry more resilient

One of the hypotheses of this projection factors in a possibly limited tree lifetime. A major technical chance has been undertaken, with some growers gradual switching to clonal plants. This type of rootstock could, in addition to increased longevity, lead to greater production homogeneity and productivity gains. If the process begun by some operators is taken up by others, it could considerably change the projection for 2030. The switch to low-rate fertilisation could also have a highly positive impact on yield, as well as the average sizing profile, with small fruit predominant at present. However, the system remains very marginal (especially due to the direct cost of around \$4 000 to \$5 000/ha excluding related facilities). Its development should remain relatively limited in the coming years.

Steep increase in the labour requirement, a production factor already under tension

Our study shows a steep increase in production, which could quadruple by 2030. So personnel requirements will undergo a big increase, in terms of both the orchards and packhouses, as well as ancillary services (land transport, etc.), especially since the Colombian industry is highly labour-intensive (mechanisation difficult because of the relief). This production factor is already under heavy tension in some zones. To prevent it from becoming limiting, professionals will need to continue to be more appealing than the other agricultural industries (especially coffee), in terms of both wages and welfare. This factor should be incorporated into the profitability equation.

Political and security context

The political and security situation, which has distinctly improved since the 1990s, remains fragile in some zones. Tensions have noticeably heightened since the pre-electoral period. Furthermore, the environmental regulatory framework could become more restrictive. Thus, some regions, although suitable for cultivation, remain difficult to exploit. Investments in the crop could slow down due to this context.

