

HASS  
AVOCADO  
BOARD



2023

## Country Profile: Morocco

Producer country profile produced by *CIRAD, The Centre De Cooperation International En Recherche Agronomique Pour Le Développement.*

World avocado production prospects

# Morocco

A major new player  
in the Mediterranean

## Acknowledgements

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Photo credits: Noémie Cantrelle, Eric Imbert

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# The avocado in Morocco

A major player in the international fruit trade, Morocco in just the past few years has hoisted itself into the world's top ten avocado suppliers, with exports approaching 50 000 tonnes in 2022-23. The rapid progression of this new industry is based mainly on the pedoclimatic conditions well-suited to Hass cultivation on the coastal strip situated between Rabat and Larache in the north of the country, and on its excellent economic competitiveness, especially for serving the EC market. With a cultivation area of approximately 12 000 hectares in 2023, the export potential should double by 2027 or 2028, to reach 100 000 tonnes.



# History

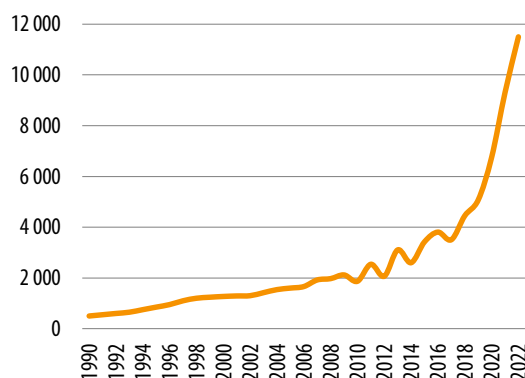
## A recent industry, but with dizzying growth

The first avocado adaptation trials in Morocco go right back to the French colonisation period. A few pioneering plants were introduced by the “Horticulture Bureau” in the 1930s for evaluation purposes in the Agdal botanical garden in Rabat, and on the Ain Taoujdate trial station near Meknes. The few varieties selected came from California, based on the Mexican race for cold resistance properties (Fuerte, Panchoy, Puebla, Mayapan, etc.). The tests showed that some cultivars prospered in the pedoclimatic conditions of the Gharb/Loukkos coastal zone, with Morocco’s northern plain region boasting some of the best agronomic potential in the country. Nonetheless, despite some attempts at promotion, especially at agricultural shows in the late 1940s, and the expansion of the collection with the introduction of Hass in the 1950s, cultivation of this “exotic plant” saw only very limited development in the following years.

The first real commercial development took place in the mid-1980s, with a view to supplying the local market. A first large-scale plantation was set up by the “Des Domaines Agricoles” group in Dar Essalam, near Rabat. A commercial outlet opened up, with in particular growing demand for dairy products (mahlaba), the industry having incorporated the avocado into its milk shake range (“panachi”) – a mode of consumption still very popular today. Other growers in the same zone set up in the crop (“Domaine du Lac” in Rabat, “Domaine du Pontet” in Sidi Bouknadel, etc.), with the stock based mainly on the Fuerte, Bacon, Zutano, Gwen and Hass varieties. Trials were also conducted further south (El Jadida, Taroudant, etc.), though they were unsuccessful because of technical obstacles. During this take-off phase, the plants came mainly from the Dar Essalam nursery owned by the “Des Domaines Agricoles” group, which had developed a line of exotic fruit plants including the avocado.

The growth dynamic gained fresh impetus in the 1990s. The emergence of an export outlet to Europe attracted other growers, with the industry switching to the benchmark variety of international trade, i.e. Hass. Abaz was the main pioneer in the development of this export industry. Expansion of the cultivation area gathered pace thereafter, though it remained very gradual, relying on a wide base of small and medium growers interested in this crop which could generate significant economic returns from small plots. Surface areas reached approximately 2 000 hectares in the early 2010s, according to official statistics. It was above all during the following decade that the industry upscaled, with the cultivation area reaching 4 000 ha in 2018, then exploding to achieve its current approximate estimate of 12 000 ha.

**Avocado - Morocco - Evolution of planted areas**  
(in hectares | source: Moroccan Ministry of Agriculture)



This dynamic, as strong as it is recent, was built on the agronomic potential of the Gharb zone, and the prospects offered by the proximity of the developing EC market, where the Moroccan avocado enjoys favourable access conditions (zero customs duty, no entry price).

Unlike other industries, it was nearly solely built on private funds. While growers were entitled to aid measures for certain investments under the Agricultural Development Fund, like other crops (micro-irrigation, frost prevention wind machines, establishing packing stations), the avocado industry was not part of those covered and largely subsidised by the “Maroc Vert” plan. The main players in this dynamic were local investors of all sizes (from smallholders to agri-business groups, seeking in particular a diversification crop for the strawberry, a highly labour-intensive crop which went through a considerable crisis), and more recently foreign groups (Spanish, Israeli, Qatari, etc.). Surface area expansion saw a distinct slowdown in 2023, in the face of more uncertain medium-term market prospects, and rising pressure on water resources and land.



## Morocco in a few figures:

- **Population:** 37 million in 2023
- **GNI/capita:** US\$7,486/year  
(source World Bank - 2022)
- **Agriculture:** 10.7 % of GDP  
(source World Bank - 2022)
- **Value of main agricultural exports:** €7.6 billion  
(source Moroccan Ministry of Agriculture - 2022)

### Main agricultural export products: (source Comtrade - 2022)

- **Tomato:** €1,028 million
- **Easy peelers:** €539 million
- **Strawberry:** €334 million
- **Blueberry:** €291 million
- **Beans:** €242 million
- **Watermelon:** €203 million
- **Avocado:** €147 million



# Cultivated areas concentrated on the Gharb coastal strip

The precise extension of the Moroccan cultivation area is not known, due to the lack of recent agricultural surveys. Dialogue with professionals questioned led us to believe that it was about 11 000 ha to 12 000 ha at the start of 2023. The main production centre is distinct from the historic one, alongside three smaller zones planted more recently (with the viability of one seemingly compromised).

The cultivated areas are primarily concentrated between northern Rabat in the South and Larache in the North, over a coastal strip approximately 140 km long and 7 to 8 km wide. From south to north, we can mention in particular the zones of Sidi Bouknadel, Southern Kenitra, Ouled Berjal, Sidi Allal Tazi, Ouled Mesbah, Moulay Bouselham and Larache. This region enjoys a particular Mediterranean climate, contrasting with the much hotter and drier conditions present in most of the country. It is one of the most favourable for agriculture (known as the "Bour favorable" zone). The temperatures are relatively mild, with average minima of around 7°C to 9°C in the coldest month (January) and average maxima of 29°C-32°C in the hottest month (July or August). However, cold spells are possible, as well as strong heat waves, especially in spring when the Chergui blows (the Moroccan term for the Sirocco). The proximity of the sea and coastal lagoons (Merja Zerba and Daoura) help mitigate these extreme temperature spells.

Furthermore, this region is among the wettest in the country, thanks to the Atlantic impact, with a downward gradient from north to south. The cumulative annual average precipitation over the past four years ranges from 420-520 mm in Larache to 350-450 mm in Kenitra. The wet season extends from October to April (tending to be shortened to March, or even February), with the rest of the year being very dry. Finally, it has among the most abundant water resources in the country, with the presence of four major water tables (from south to north: Gharb, Drader-Soucir, Rmel and Loukkos). They are fed mainly by water from the rivers Loukkos and Sebou and their tributaries, which drain some of the large cumulative volumes received by the western and southern faces of the Rif Mountains. The northern part (River Loukkos) has storage structures (El Makhazine dam in particular, which has a high capacity). Salinity can pose problems in some zones of the coastal strip, where seawater gets into the groundwater. Nonetheless, pressure on the water resource is tending to increase, particularly in the southern part of the zone where water reserves are lower. The regular presence of mist is another of the zone's climate features. These layers generally appear in the evening and only dissipate in the morning, increasing the relative humidity.



The soils are well-suited to avocado cultivation, with a generally sand-loamy texture throughout the zone. The loam content increases with proximity to the Rivers Loukkos and Sebou, or to the coastal lagoon zones. While the organic matter content is low, their drainage capacity is high.

Three other cultivation centres have been established in recent years outside of this historic zone now close to saturation. The first is situated around the districts of Sidi Slimane and Sidi Yahya. It is rapidly developing, with already more than one thousand hectares. The main asset of this region, historically planted with eucalyptus for paper manufacturing, is the presence of large areas of land enabling big plantations to be established (up to several hundred hectares) – an exception in the country. Furthermore, the water table has been hitherto under-exploited, and water availability is good, as is the quality. The soils are sandy, though conversely sometimes shallow (presence of limestone slab). The risk of extreme climate incidents is higher both in the winter and summer, since the oceanic influence is more limited in this more continental area, situated 30-40 km from the sea.

Some still modest plantations (300-400 ha) have also been established south of Casablanca, in the Azemmour region. The climate is temperate and highly favourable, and the clay-sandy soils decent. Conversely, the groundwater is highly saline and requires treatment. The project to set up an irrigated area of 5 000 ha (Sidi Rahal), fed by the Grand Casablanca desalination plant which should open in 2030, could at least partially solve the problem.

Finally, a few hundred hectares have been established east of Rabat, near Tiflet. However, the water resources seem too limiting.



### Strengths:

- Attractive production cost.
- Proximity to the EC market.
- Pedoclimatic conditions in the historic zones.

### Challenges:

- Pedoclimatic conditions in some new zones.
- Pressure on water resources.
- Production/trade relationship.

# The avocado in Morocco

 Avocado zone





# Production system

## A solid base of small and medium growers

The Moroccan industry is based on small to medium plantations, many of them covering between 1 and 10 hectares, according to experts. Besides fragmentation of the agricultural zones across all crops (two thirds of the country's UAA farmed by plantations of 0 to 20 ha, according to the latest survey in 1996), the particularities of the Moroccan land system poses serious obstacles to the establishment of large-scale plantations. On the one hand, not all land is registered, and therefore does not have a title deed, since there is an Islam-inspired traditional land legal system coexisting with the modern registration system. On the other hand, approximately 18 % of the Kingdom's land is collective, with the tribes entitled to inalienable ownership under the care of the State. While long-term leases (21 years) are possible, the tenants' position remains fragile. Hence, according to our estimate, just 25% to 30 % of the Moroccan cultivation area lies in plantations of more than 100 ha.



## A production system ranging between basic and cutting-edge

The production system differs greatly according to the plantation size. It is very basic among the smallholders. On this type of farm, the plant stock has often been selected on the cheap from small nurseries not offering any real guarantees in terms of productivity or sanitary quality (viruses). The planting density, previously around 300 plants/ha (type 6 x 6), is on an upward trend, currently at a level of 400-450 plants/ha (4 x 6 or 4 x 7 pattern). Fertigation is practically systematic, even on these small plantations (big State subsidies until mid-2022, and occasional use of second-hand equipment). Annual pruning is generally not applied. The technical level of the growers is relatively low. The production potential is limited, at around 8 t/ha on average, and the alternate bearing phenomenon often marked.

There is a distinct contrast with the big plantations. The high-quality plant stock generally comes from the country's three main nurseries, with plants produced locally or imported from Spain. The main rootstocks used are Zutano, Bacon and Waterhall. Clonal plants are not commonly employed, with good results achieved using conventional rootstocks, and there being practically no *Phytophthora*. The planting densities are generally 4 x 6 (some growers who developed 3 x 4 in the first years of the cycle have reverted to conventional densities thereafter). Fertigation is systematic (micro-jet or drip), with use of solar energy being developed to supply the pumps. Annual pruning is not always applied. Systems to protect against excessive temperatures are sometimes installed on the coastal zone, and practically systematically on plantations situated inland.





### Low sanitary pressure, and highly competitive production costs

Generally speaking, water requirements vary according to the soils: from 8 000 to 10 000 m<sup>3</sup>/ha depending on the texture. There are few sanitary problems, although they are tending to become more serious. The main pest is a mite, *Oligonychus perseae*, well known in the Mediterranean and detected in Morocco in 2018. Attacks have been more frequent in recent campaigns. There are also some thrips (especially greenhouse thrips), as well as some mealybugs. Regarding diseases, there are problems of young plant deaths due to air-borne fungi of the Botryosphaeriaceae family, probably because of the increased climate stress. *Phytophthora* is not common, as the soils are generally sandy and well-draining, and drip irrigation is widespread.

Production costs are competitive. On the one hand, while pressure on the agricultural water resource has greatly increased in the last few years, its price remains very low. For the majority of growers pumping from the groundwater, there is no de facto pricing, with the cost of the water limited to the pumping cost. On the other hand, the expenditure associated with sanitary protection remains moderate, although it is increasing. In addition, the price of agricultural labour is among the lowest for the major avocado producer countries (around €300/month, including welfare costs). Finally, road-freight costs to Europe are another comparative advantage over the South American suppliers.

The organic production mode is fairly under-developed. According to FIBL statistics, the country had 630 ha of certified organic avocado orchards in 2021, and 153 ha under conversion (approximately 8 % of the cultivation area).



# Outlets and production calendar

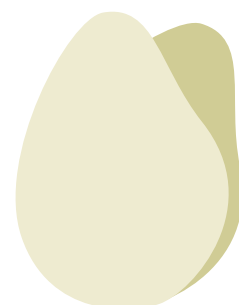
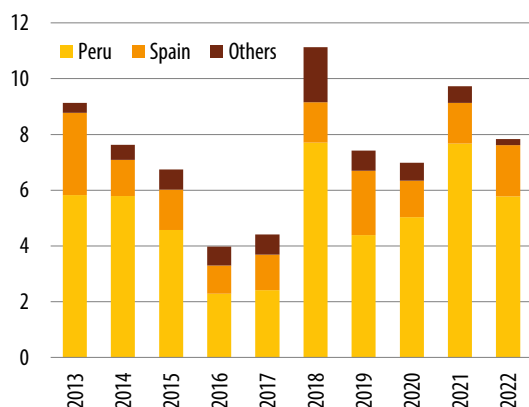
## Hass primarily for export

Production is mainly aimed at the export sector. Nonetheless, the local market is developing. It primarily takes in the green varieties (approximately 15 % of the country's total production) and the Hass sorting rejects (categories 2 & 3 and small fruit, which represent between 10 % and 20 % of production). The size of the local market can be estimated at approximately 25 000 t-30 000 t if we add imports (approximately 8 000 t to 10 000 t in recent years, primarily from Peru in the counter-season and small Spanish fruit). So annual consumption per capita would seem to be around 700 to 800 g. The avocado is generally served in salads, or in the more original and typical form of milk shakes, locally known as "panachi" (a mixture of avocado pulp and banana, sugar or honey and dried fruits such as dates and nuts such as almonds). The country does not have an avocado processing industry of significant size.

Avocado – MOROCCO – Production calendar

Varieties	O	N	D	J	F	M	A	M
Hass								

Avocado - Morocco - Imports  
(in 000 tonnes | source: Comtrade)

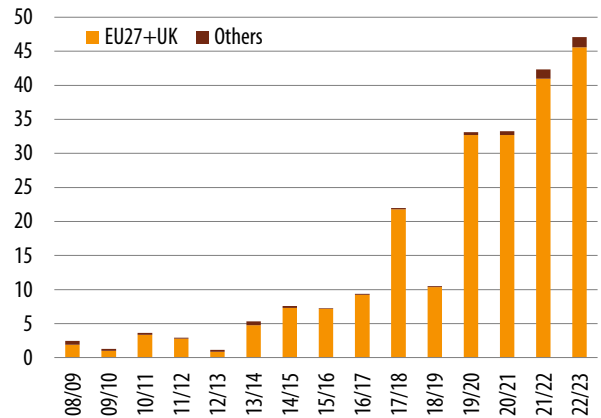


# Exports

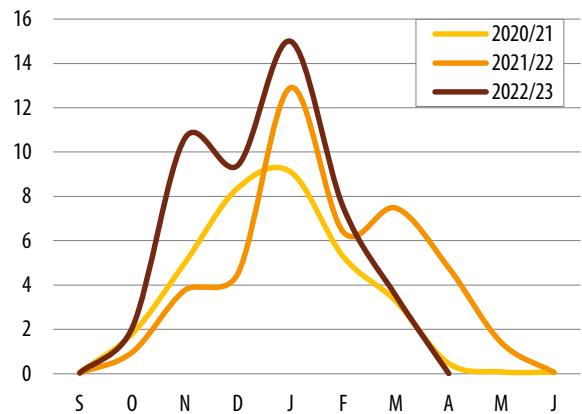
## Exports rising steeply, focused on Western Europe

Morocco's status on the international stage has changed over the last five years, emerging from obscurity to join the international trade top ten. Exports, still below 10 000 t in 2016-17, exceeded 45 000 t in 2022-23. Practically all volumes are aimed at the EU27+UK, the closest market (4 to 5 days to serve Paris), where the Moroccan avocado enjoys favourable access conditions (zero customs duty, no entry price). A large proportion of the volumes is exported in bulk form (10 or 20-kg boxes) to Spain, the hub from which Moroccan fruit is packed and distributed to the rest of Europe by operators specialising in exotic fruits in the Vélez Málaga region. This destination remains predominant, though its importance is tending to wane as Moroccan exporters are increasingly developing direct shipments to the consumption markets. France comes in second place, ahead of the Netherlands. Nearly 90 % of total exports are aimed at these three countries, followed by Germany and the UK. Shipments to the latter market progressed quite considerably in 2022-23, with the opening of a direct shipping line. What small volumes are exported outside Western Europe are aimed mainly at Russia, the Gulf States and nearby African countries (Mauritania, Senegal, etc.).

**Avocado - Morocco - Evolution of exports**  
(in 000 tonnes | source: Customs)



**Avocado - Morocco - Monthly exports**  
(in 000 tonnes | source: Customs)



**Avocado – MOROCCO – Exports**

in tonnes	2018/19	2019/20	2020/21	2021/22	2022/23*
<b>WORLD</b>	<b>10 487</b>	<b>33 142</b>	<b>33 284</b>	<b>42 307</b>	
<b>EU27+UK, incl.</b>	<b>10 334</b>	<b>32 692</b>	<b>32 677</b>	<b>40 973</b>	<b>45 600</b>
Spain	6 145	21 712	21 009	15 266	
France	2 748	7 118	6 375	14 110	
Netherlands	99	2 132	1 973	7 359	
Germany	1 297	1 328	1 768	2 693	
United Kingdom	44	117	549	975	
<b>OTHERS, incl.</b>	<b>153</b>	<b>450</b>	<b>607</b>	<b>1 334</b>	<b>1 500</b>
Russia	-	93	391	639	
Mauritania	115	143	97	227	
United Arab Emirates	3	81	38	123	

\* Estimate | Source: Comtrade



# Organisation

## A highly speculative market system

The export sector is fairly concentrated. Of the twenty or so facilities operating internationally, the seven or eight biggest on their own made approximately three quarters of shipments, according to experts. There is one major exporter (more than 10 000 t) and six or seven medium-sized operators operating between 2 000 t and 4 000 t. Exporters generally have a small production base of their own, with two exceptions (the leader Zairi and Abaz). They procure either directly or via brokers. There are fifteen or so of these intermediaries, generally based in the wholesale trade in Rabat and Casablanca, which see approximately half of Moroccan production pass through their hands. They leave a major mark on the industry, making it highly speculative in its workings. The big advances paid to growers to reserve the fruit at the beginning of the season encourages them to harvest only when the market conditions make it possible to cover their costs, or at the latest at the end of a period defined contractually with the grower (generally late January). So fruit availability is highly irregular, and varies according to market opportunities. This system is currently a weak point for exporters, while Moroccan production is upscaling and the downstream segment has a growing need for regularity and reliability in its procurement to honour increasingly contract-based sales.



# Logistics

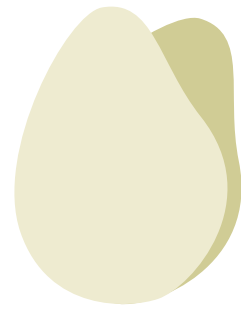
## Short-range logistics to serve Western Europe

The Spanish and French markets are served by lorry, with a ferry crossing between Tangier and Algeciras. The transport time is around 2 to 3 days to reach Spain, 3 to 4 days for the South of France and 4 to 5 days for Rungis. Northern Europe can be served by road-freight (5 to 6 days) or sea-freight from Tangier (3 days).



# Projected export potential

## Approaching the 100 000 tonnes production mark!



The variables used to generate this projection are:

### Cultivation area:

Official sources from the Ministry of Agriculture. These figures are questionable since the last agricultural survey dates from 2016, whereas there has been a very strong dynamic in recent years, which derives in part from a very high number of small or medium plantations. Nonetheless, we believe they are fairly credible. They reflect a planting boom in recent years (increase approximately 1 700 ha between 2019 and 2020, and over 2 500 ha between 2020 and 2021), with surface areas of around 9 300 ha in late 2021. These figures appear consistent with the estimates of the professionals surveyed (growers, exporters and big nursery operators).

### Cultivation area expansion rate:

The official data go up to 2021. We opted to retain a high expansion rate in 2022 (+ 2 200 ha). Conversely, we decided to consider a distinct fall in the planting rate from 2023. Nursery sales have slowed down greatly, with the sector for the first time going through an over-production crisis. This turnaround in trend is multi-factorial. True, Morocco does have some major assets in terms of the proximity of the European market and production costs, enabling it to remain competitive even in a more competitive market context. Nonetheless, some technical obstacles remain or are becoming more acute. The land system structure is a weak point. The potential of some new zones can also be questioned, for pedological or climate uncertainty reasons. Most of all, the issue of water availability is more salient than ever. On the one hand, climate change has caused a very considerable fall in average rainfall in recent years. In the face of a drop in resources estimated at 30 % by the Ministry of Agriculture, a vast action plan aimed at ensuring “water sovereignty” was presented in spring 2023. It is aimed both at better harnessing the available potential (new dams, desalination units, transfer system from the better-off zones to those where the resource is more limited), but also at better use (micro-irrigation) and controlling use (quotas). In some high-pressure zones, irrigation of the agricultural areas has actually been suspended (Tadla, Haouz, Doukkala, etc.).

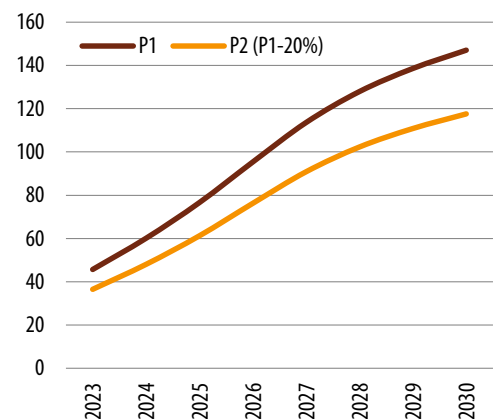
### Yield:

We considered two classes. For small and medium growers, we reckoned on an average export yield hypothesis of 8 t/ha smoothed over several years (from 6 to 10 t/ha according to the technical level of the growers and the effects of alternate bearing). For the higher-tech growers with larger surface areas, we reckoned on a yield of 12 t/ha smoothed over several years (from 10 to 14 t/ha). We assumed young orchards enter production from the third production cycle, and that productivity rises gradually to its full potential during the sixth cycle.

### Cultivation area structure:

We assumed a percentage of big growers of around 30 % in 2023. According to our hypothesis, this proportion will grow in the coming years, to reach 40 % in 2026.

**Avocado - Morocco - Evolution of export potential**  
(in 000 tonnes | source: Cirad)



## Calculation

In methodological terms, we worked in three stages to go from the raw surface area data to the production projection. The first stage consisted of calculating, for each zone and each projection year, a theoretical cultivation area in full production. The calculation was based on surface areas of fully mature orchards and of young orchards gradually entering production, factoring in a simplifying overall hypothesis to estimate their progression to prime and maturity (see yield hypotheses). These theoretical surface areas were then multiplied by an average yield in full production, defined for both grower classes in question.

## Results

We opted to propose two export potential projections, one nominal and one assuming a fall of 20 % in yield due to the consequences of climate change: more frequent vagaries (especially heat-waves), reduced water availability and deterioration of water quality in some zones (salinity). The results are as follows. The 100 000-t mark will be exceeded in 2027 according to the first model, and in 2028 according to the second. Eventually, in 2030, volumes would near 150 000 t under the first option, and 120 000 t under the second.

