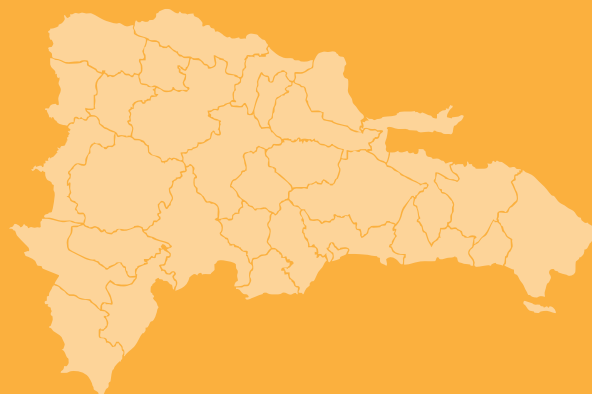


MARKET PROFILE

Market profile

Niche Mango Varieties from the
Dominican Republic





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Abstract

This report highlights the largely untapped potential of the **Mingolo, Crema de Oro, and Banilejo mango varieties in European markets**. These three varieties possess characteristics that can appeal to specific European consumer segments.

European market opportunities exist within niche markets in Southern Europe that appreciate premium exotic fruits and are more tolerant of fibrous varieties. This creates market opportunities for all three niche varieties. Furthermore, **retail and niche markets in Scandinavian and Northern European countries show a preference for smaller-sized, sweeter mangoes**, aligning with the profiles of Mingolo and Banilejo. However, Banilejo is considered too small for European retail markets. Lastly, **ethnic supermarkets and speciality stores in the UK support the potential of all three varieties, as the Indian community** there is familiar with exotic fruits and has a preference for **fibre-rich** mango varieties.

Accessing these European markets requires a **focused and strategic approach**. Key actions for Dominican exporters and producers include:

- **Building market awareness through compelling storytelling** that emphasises the unique characteristics, origin, and growers behind each variety. Providing samples to interested importers is also crucial for evaluation.
- **Strict adherence to stringent European quality and food safety standards**, including obtaining GLOBALG.A.P. certification as a minimum, often combined with **SMETA for social and ethical standards**. Implementing robust **food safety and quality management systems in packhouses** is essential.
- Ensuring strict compliance with **Maximum Residue Levels (MRLs) for pesticides** and providing **phytosanitary certificates** verifying

freedom from fruit flies in accordance with EU regulations.

- **Addressing shelf-life limitations** through further testing and evaluation.
- Expanding the availability and use of **cold logistics** and **storage infrastructure** throughout the supply chain to reduce postharvest losses and improve export competitiveness.
- Exploring **controlled ripening protocols** to potentially enhance quality and enable cost-effective sea freight in the future, targeting cost-sensitive markets like the retail market.
- **Targeting niche markets through the strategic positioning** of these varieties as potentially **premium products**. This can be achieved by maximising ripeness before harvest, utilising **high-quality and distinctive packaging**, and considering air freight for maintaining freshness for such niche markets.
- Maintain **reliable and short supply chains** by ensuring thorough pre-transport coordination with all stakeholders, enabling immediate pickup upon arrival to preserve product quality and minimise shelf-life loss.
- Maintaining **strong fruit fly management practices** to ensure a consistent supply, particularly when competing with other suppliers.

By prioritising these actions, Dominican mango exporters and producers can effectively tap into the identified niche market potential in Europe, building a strong reputation for the unique Mingolo, Crema de Oro, and Banilejo mango varieties.

1. INTRODUCTION

1.1 Summary

- Over 300 varieties are cultivated in the Dominican Republic. This study focuses on the Mingolo, Crema de Oro, and Banilejo due to their expected export potential to Europe.
- The mango value chain transitioned from wild mango growth on courtyards and farms before 2000 to a more structured and export-oriented value chain nowadays.
- According to PROMANGO, exports now (2025) account for 50% of total mango production.
- Within the different markets, the high-quality fresh mangoes for export generate the most value.
- Profit margins are highest for large companies and exporters; small producers face low returns and productivity challenges.
- The study used the following methods: literature review, expert interviews with importers and an exporter, and a qualitative questionnaire.
- Practical outcome recap: Need to improve producers' access to the market, while focusing on increasing the productivity per hectare.



Figure 1. Summary of Chapter 1, including the practical outcomes mentioned in the chapter (displayed in orange).

1.2 Mango varieties

In the Dominican Republic, many mango varieties are cultivated, with numbers of even up to **300 mango varieties** produced in the country.¹ **Keitt is the variety that leads** in international demand, but also the Mingolo, Crema de Oro, Kent, Palmer, Parvin, Madam Francés, and Banilejo are popular varieties in the Dominican Republic.^{1,2}

This market profile will focus on three of these varieties: **Mingolo, Crema de Oro, and Banilejo**. These three varieties are selected because they have been identified in the Dominican Republic to have a strong export potential in Europe, serving a niche market, as is already being served in the United States of America (USA). It should be noted that the Crema de Oro variety is also known as Grano de Oro, Crema de Leche, or Amarillo. Table 1 and Table 2 show some **key characteristics** of the three selected varieties.










Table 1. Key characteristics of three selected mango varieties: Mingolo, Crema de Oro, and Banilejo. Source: Based on information from PROMANGO.

	Mingolo	Crema de Oro	Banilejo
Size	Medium	Medium	Small
	Weight: 275-550 g	Weight: 250-350 g	Weight: 150-250 g
Skin	Green skin that ripens to bright yellow	Thick green skin that ripens to golden-yellow	Green skin ripening to pinkish-yellow. Skin clings easily to the flesh when fully ripe
	Hunter Colour Values: L=45, a=-3, b=21	Hunter Colour Values: L=40, a=-5, b=25	Hunter Colour Values: L=48, a=8, b=20
Aroma	Tropical fruit and peachy notes, very sweet	Mild, sweet and tropical notes	Strong, sweet, and tropical profile
Texture	Smooth, firm flesh with long fibres	Smooth and firm, minimal and delicate fibres	Soft, minimal and delicate fibres
Shape	Oblong shape	Oblong shape	Round or semi-oval
Peak availability	March - July	March - May	May - July

1 Dominican Today. (2024). Dominican Republic projects \$50 Million in Mango exports for 2024. <https://dominantoday.com/dr/local/2024/05/31/dominican-republic-projects-50-million-in-mango-exports-for-2024/>

2 Fresh Plaza. (2024). Dominican Republic mango production to increase by 15% in 2024 season. <https://www.freshplaza.com/north-america/article/9621305/dominican-republic-mango-production-to-increase-by-15-in-2024-season/>

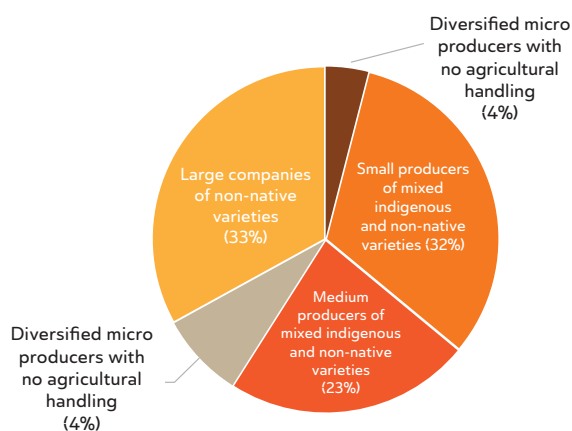
Table 2. Pictures of the three mango varieties. Source: PROMANGO.

Mingolo	Crema de Oro	Banilejo
		
		
		

According to PROMANGO, Mingolo has seen a steep increase in export demand over the past five years, when before it was a little-known variety. Similarly, the Crema de Oro has gained popularity over the last decade (both locally and export) and its cultivation is steadily increasing in the Peravia province. Banilejo is the most widely recognised variety in the Dominican Republic.

1.3 Value chain description

Before 2000, mango production in the Dominican Republic was not a commercial value chain, as mangos were mostly wild fruits that naturally grew across courtyards and farms. From 2000 onwards, mango started to be **increasingly seen as a potential export product**. The value chain significantly developed between 2000-2020 through funding from the national government and international organisations. An example of a program by the national government is the “Quality Strengthening for the Development of Micro, Small and Medium Enterprises (MSMEs)”, which supported the strengthening of value chains such as that of the mangoes. This program was implemented by the Ministry of Industry, Trade and MSMEs (MICM).³ The mango production in the Dominican Republic consists of **various types of producers**, ranging from farms with **scattered indigenous mango trees** to



commercial monoculture plantations (Figure 1).

Figure 2. Five different types of mango producers in the Dominican Republic. Source: European Commission. (2020). Mango value chain analysis in the Dominican Republic.

When considering the last five years, it should be noted that more large companies of non-native varieties have shifted to being large producers of mixed indigenous and non-native varieties.

Most producers are part of an association which are assembled in the Dominican mango cluster **PROMANGO**, providing support and technical advice to the value chain.³

The mango value chain not only focuses on exporting fresh fruits but also supplies a variety of markets, which are:³

- Premium fresh fruits for **local supermarkets and hotels**, in 2020, accounted for 48% of the production. Sales are performed indirectly, through small intermediaries, selling to large intermediaries who sell to supermarkets and hotels.
- Premium fresh fruits for **export** by sea⁴ accounted for 30% of the production in 2020.
- Non-classified fresh fruits for the **local markets** accounted for 18% of the production in 2020.
- **Pasteurised mango concentrate** for domestic and export markets accounted for 2% of the production in 2020, only using Banilejo mango variety.
- **Mango pulp** for domestic and export markets accounted for 1% of 2020's production.

It is worth noting that over the past five years, the share of premium fresh mangoes supplied to local supermarkets and hotels has declined, while **exports of these premium mangoes have increased**. According to PROMANGO, exports now (2025) account for 50% of total mango production.

Within these different markets, it can be established that the high-quality fresh mangoes for export generate the most value. The generated value in the processed fruit markets is lower compared to that of the

³ European Commission. (2020). Mango value chain analysis in the Dominican Republic.

⁴ The source gives no information on export by air.

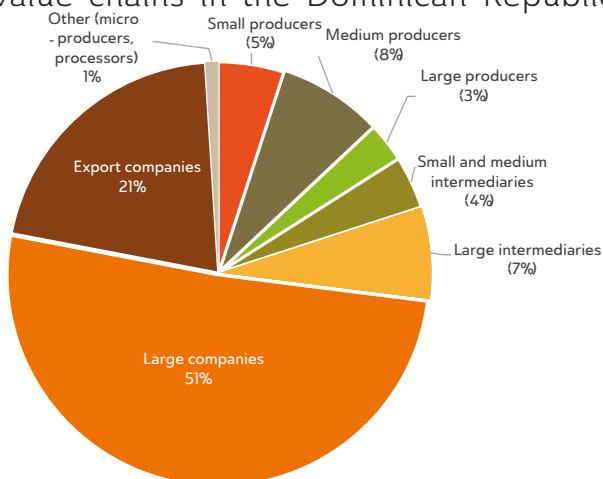
high-quality fresh mangoes for the domestic markets.³

In terms of the financial viability of the mango value chain, the activities in the chain can be considered **profitable**.³ The operating profit is defined as the income remaining after subtracting production and operational costs, but before taxes. This operating profit is positive for all actors in the mango supply chain, including micro and small producers.³ However, compared to other exporting value chains in the Dominican Republic

Practical outcome: Need to improve producers' access to the market, while focusing on increasing the productivity per hectare.

The value chain is strongly integrated into the national economy since only a few goods and services need to be imported.³ This is supported by the fact that the part of the value of production that benefits national actors was estimated to be 92% in 2020.³

The value chain of mangoes in the Dominican Republic is visualised in Figure 4.



(such as pineapple), the operating profit remains relatively low.³ The distribution of net operating profits by actors is indicated in Figure 2.

Figure 3. Net operating profits distribution by actors.
Source: European Commission. (2020). Mango value chain analysis in the Dominican Republic.

This figure shows that **large companies dominate the value chain**, indicated by their significant share in operational profit. **Export companies** follow as major players, benefiting from mango exports, which have high added value. The **intermediaries** also play a key role due to their control of the market processes for domestic and export markets. Producers are essential to the supply of mangoes, although their share is relatively low. This reinforces the need to **improve producers' access to market opportunities** and better returns. Especially small producers have difficulty in reaching export markets, mainly because of their **low productivity per hectare**. Therefore, there is a need to adopt new technologies and identify production bottlenecks to boost productivity.

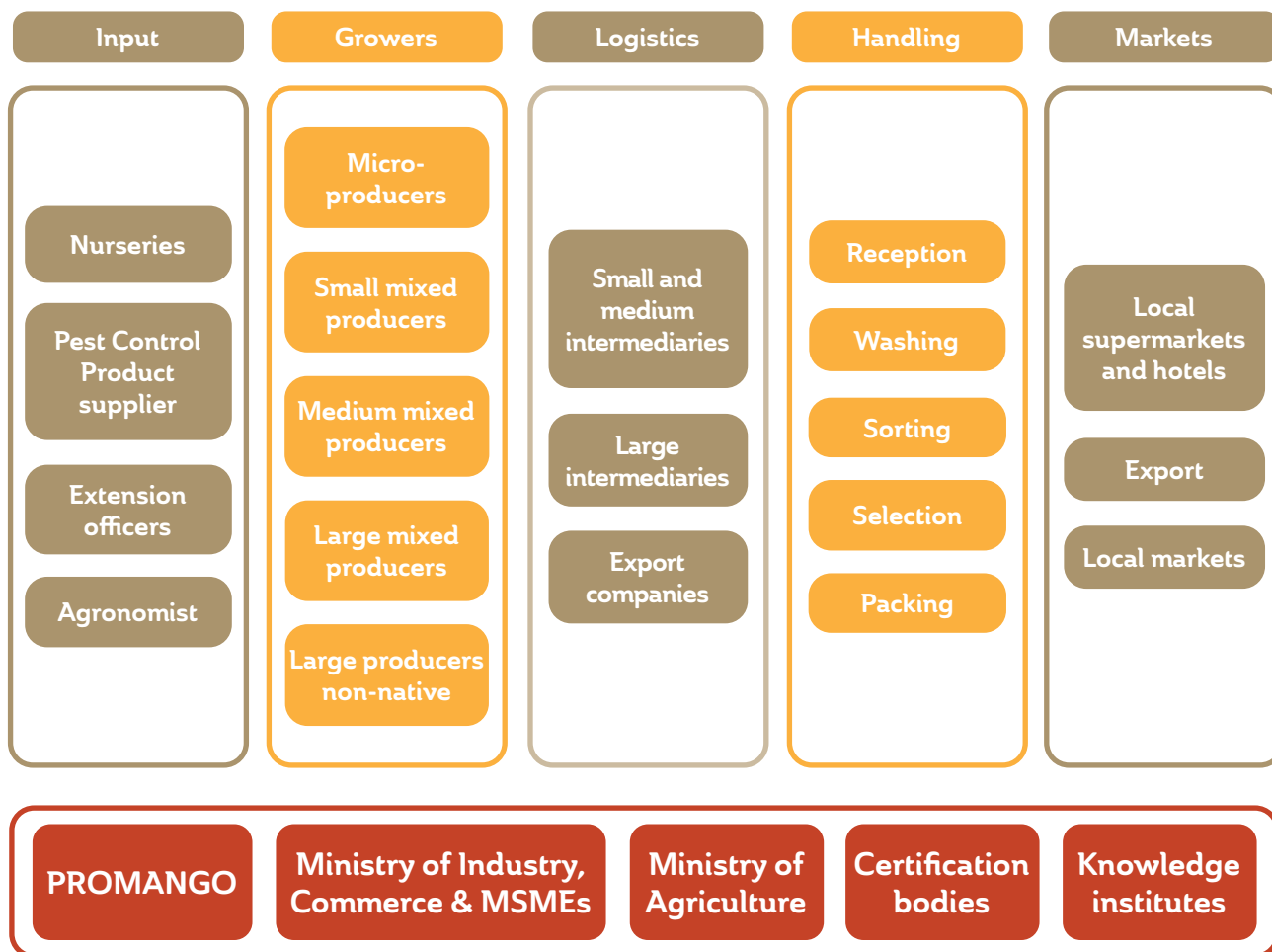


Figure 4. Main value chain actors in the mango value chain in the Dominican Republic

When mangoes are destined for export, they can enter the consumer market via several channels (Figure 4). **Importers** are pivotal in the mango distribution chain as their knowledge of end-market requirements enables them to cater to a wide array of clients across various European markets. Some importers are **vertically integrated**, operating their own packing facilities. Importers can supply to large retail chains, where the volume to be supplied and quality compliance are strict, while others specialise in the market where mangoes are traded based on immediate availability and fluctuating prices without the commitment of long-term contracts. Sourcing mangoes brings challenges with price variation, fluctuating availability, and varying product qualities.

Traditional fruit **wholesalers** play a key role in the market based on immediate availability, adapting to shifts in supply and demand. They typically supply the niche market, including speciality retailers, market vendors, the hospitality sector, and restaurant chains. While some may engage in both import and wholesale activities, most traditional wholesalers avoid the risk associated with long-distance mango imports, except in the case of niche, ethnic varieties that are air freighted.

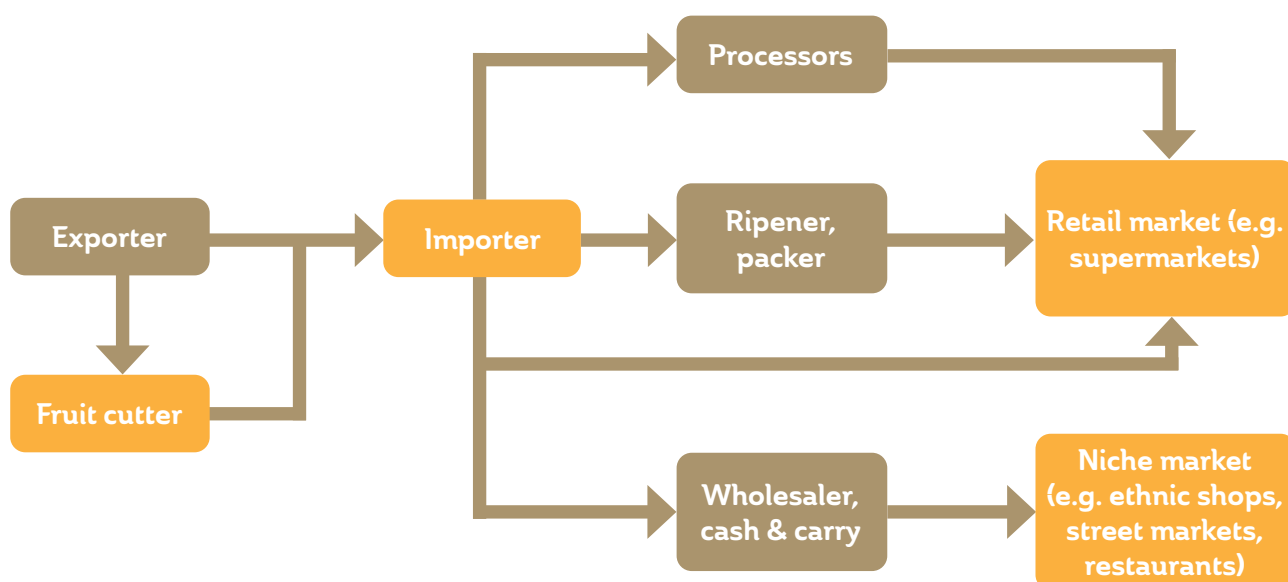


Figure 5. Market channels for exported mangoes. Source: based on CBI (Centre for the Promotion of Imports from developing countries).

1.4 Methodology

The assessment of market potential for selected Dominican mango varieties was carried out through a comprehensive **literature review** and **primary data collection**. The **literature review** focused on the Dominican mango production system, value chain dynamics, trade patterns, specific characteristics of niche mango varieties, and relevant product requirements in the European market. To complement this desk research, practical insights were gathered via eight semi-structured **expert interviews**. These included interviews with (a) European importers based in France, the Netherlands, the United Kingdom, and Denmark, all serving the broader European market, and (b) one mango exporter in the Dominican Republic.

The expert interviews followed a **semi-structured** format guided by a standard interview guide. This approach enabled targeted questioning, with each interview tailored to the respondent's specific expertise. The topics addressed included: company background, general market trends, perceptions of Dominican mango varieties, pricing and demand dynamics, product requirements and quality standards, supply chain and logistics considerations, market opportunities and future outlook, and final remarks. Additionally, PROMANGO contributed valuable information through a **qualitative questionnaire**. This mixed-methods approach ensured a holistic understanding of both theoretical and practical aspects relevant to market entry and expansion.

2. PRODUCTION

2.1 Summary

Main facts:

- In 2023, over 37,000 tonnes of mangoes were produced; 24% were exported.
- In 2024, around 1,900 producers were managing 143,000 hectares, with 1333 producers being certified for export.
- The main mango production areas are in the coastal zones of the Southwest and Midwest, with the leading province being Peravia.
- The Mingolo variety, especially, has seen growth in the export market, accounting for 32% of Dominican mango exports to Europe and 95% of Dominican exports to the USA (in 2023).
- The peak harvest season of mangoes spans from mid-April to late October and differs per variety, with the highest yield generally seen in June.
- Postharvest losses reach up to 50%, mostly due to a lack of market access, improper handling, and the limited (use of) cold storage and transport facilities.
- Climate change and pests (e.g., fruit flies, MMD, anthracnose) impact quality.
- Mingolo mango ripening is currently often done by dipping the fruits in ethylene prior to air shipment; however, this may lead to over-ripening and the rapid onset of Anthracnose.
- Postharvest technologies and treatments that are available are cold storage, hot water treatment (HWT), modified atmosphere packaging (MAP), controlled atmosphere (CA) chambers, natural coatings, and irradiation. Note that not all are suitable or widely used for Dominican Republic mango exports.
- Agricultural technology adoption can reduce operational costs and promote environmental sustainability.
- Organic mangoes suit niche markets but are less viable for mainstream retail.

Practical outcomes:

- By inducing flowering in mango trees, the harvest period can be strategically adjusted, thereby reducing competition with mangoes from other markets.
- Climate change highlights the need for improved irrigation and adaptive farming practices. Flower induction can also be used to avoid peak periods of bad weather.
- Exported mangoes should be free of pests and diseases to enhance market potential and build a strong reputation for high-quality mangoes from the Dominican Republic.
- Explore the possibilities of controlled ripening protocols to enhance shelf life, increase quality and enable sea freight. Sea freight can offer significant cost advantages (attractive for retail markets), especially if the Dominican mangoes are used to optimise container space by consolidating shipments with other shipments.
- The value chain can be further strengthened by training on best handling practices and improvement of the cold chain facilities.
- Secure fast and reliable supply chains by aligning all logistics beforehand to avoid delays and maintain product quality

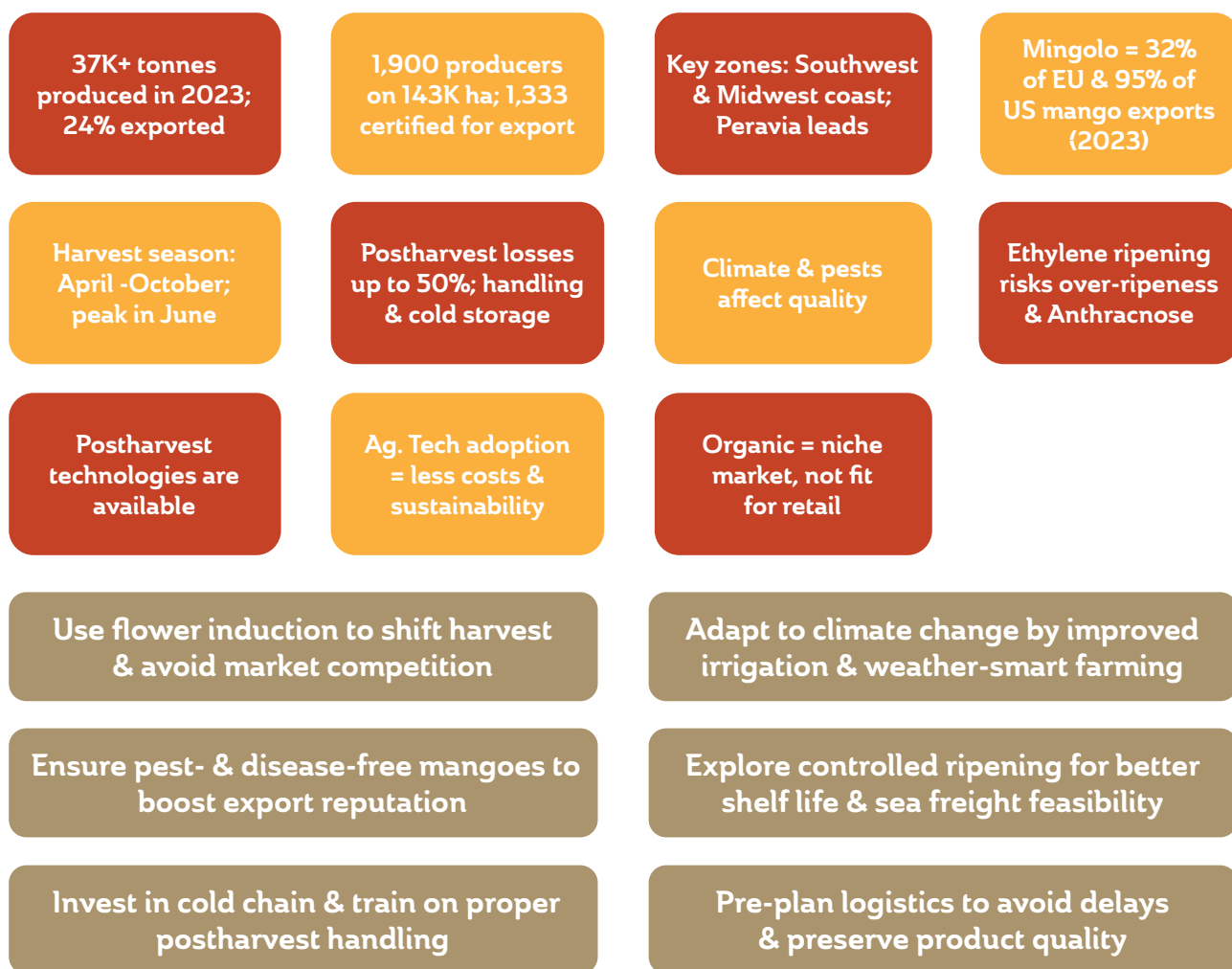


Figure 6. Summary of Chapter 2, including the practical outcomes mentioned in the chapter (displayed in orange)

2.2 Current production status

The Dominican Republic has recently emerged on the international stage of mango export. In 2023, the country produced over 37,000 metric tonnes of mangoes, with 24% of this quantity being exported.^{5,6} The Dominican Republic initially had a limited volume of agricultural exports, due to deficiencies in technology, infrastructure, skilled labour, and other critical factors necessary for efficient fruit production.⁷ However, over the years, with support from international partners and the agribusiness sector, the country has developed new technologies that have contributed to a steady increase in exports.

In 2024, the Dominican Republic is home to approximately 1,900 registered mango producers and more than 143,000 hectares of mango plantations.¹ Traditional farms yield an average of 10 to 11 tonnes per hectare, whereas more advanced farms, equipped with sophisticated production systems such as drip irrigation and advanced flower induction, can achieve a maximum yield of 30 tonnes per hectare.⁸ The country features 22 packing facilities for export, six of which are equipped with hydrothermal treatment systems, and 1,333 producers are certified to export to the USA and other international markets.⁸

Mango production occurs throughout the Dominican Republic, with organised farming primarily concentrated in the coastal zones of the Southwest and Midwest (Figure 7). The leading province in terms of cultivated area is Peravia (40% of the nation's mango plantations), followed by Azua, San Cristobal, and San

Juan (65 to 70% of the total cultivated area, production, and number of structured farms).

⁹ These areas take advantage of fertile soils and an ideal climate for mango cultivation.¹ Other production regions include the Northwest (Dajabon province, near the Haitian border), the northern region (Moca, Espaillat province), and the southeast (La Romana province).⁸ In general, the Dominican Republic benefits from a well-developed communication system, an extensive network of roads, highways, and ports in all regions, facilitating overseas trade.¹⁰

However, expert interviews highlighted that despite this extensive network, reaching certain production areas can still pose a challenge.

The niche varieties Mingolo, Crema De Oro, and Banilejo are produced predominantly for the export market, accounting for 40% of exports, generating over \$40 million in revenue and projected to reach \$50 million in 2024.^{8,9} The Mingolo variety has proven to be a significant success and has transitioned from being relatively unknown to one of the most sought-after varieties in the past 4-5 years. This mango has gained considerable demand, especially in the USA. In 2023, **Mingolo accounted for 32% and 95% of Dominican mango exports to Europe and the USA, respectively.**^{8,9,10} While **Keitt remains the most imported variety in the USA**, Mingolo is rapidly gaining popularity, alongside other varieties such as Banilejo and Crema de Oro.

The peak harvest season of mangoes spans from mid-April to late October and differs per variety, with the **highest yield generally seen in June.**⁸ During this period, the country's favourable tropical climate provides optimal conditions for mangoes to ripen. However, expert interviews reveal that several farms are experimenting with flower induction techniques to advance the harvest timeline.

5 ReportLinker. (z.d.). Global magosteens, guavas and mangoes production by country. <https://www.reportlinker.com/dataset/9fd15e3c483c9b4d34c1555fd967ed469e5e7ccb>

6 World Bank. (2023). Exports of fresh or dried guavas, mangoes, and mangosteens (HS Code 080450) by country [Dataset]. World Integrated Trade Solution (WITS). <https://wits.worldbank.org/trade/comtrade/en/country/ALL/year/2023/tradeflow/Exports/partner/WLD/product/080450>

7 Netherlands Enterprise Agency. (2024). Dominican Republic Agricultural Sector Report 2023. <https://www.rvo.nl/sites/default/files/2024-01/DR%20Agro%20Sector%20Report%202023.pdf>

8 Fruitnet. (2023, March 31). Navigating the toughest mango season in decades. Fresh Produce Journal. <https://www.fruitnet.com/fresh-produce-journal/navigating-the-toughest-mango-season-in-decades/260612.article>

9 Fruitrop. (2016). Dominican mango. Fruitrop. Retrieved from <https://www.fruitrop.com/en/Articles-by-subject/Full-country-profile/2016/Dominican-mango>

10 Netherlands Enterprise Agency. (2024). Dominican Republic Agricultural Sector Report 2023. <https://www.rvo.nl/sites/default/files/2024-01/DR%20Agro%20Sector%20Report%202023.pdf>

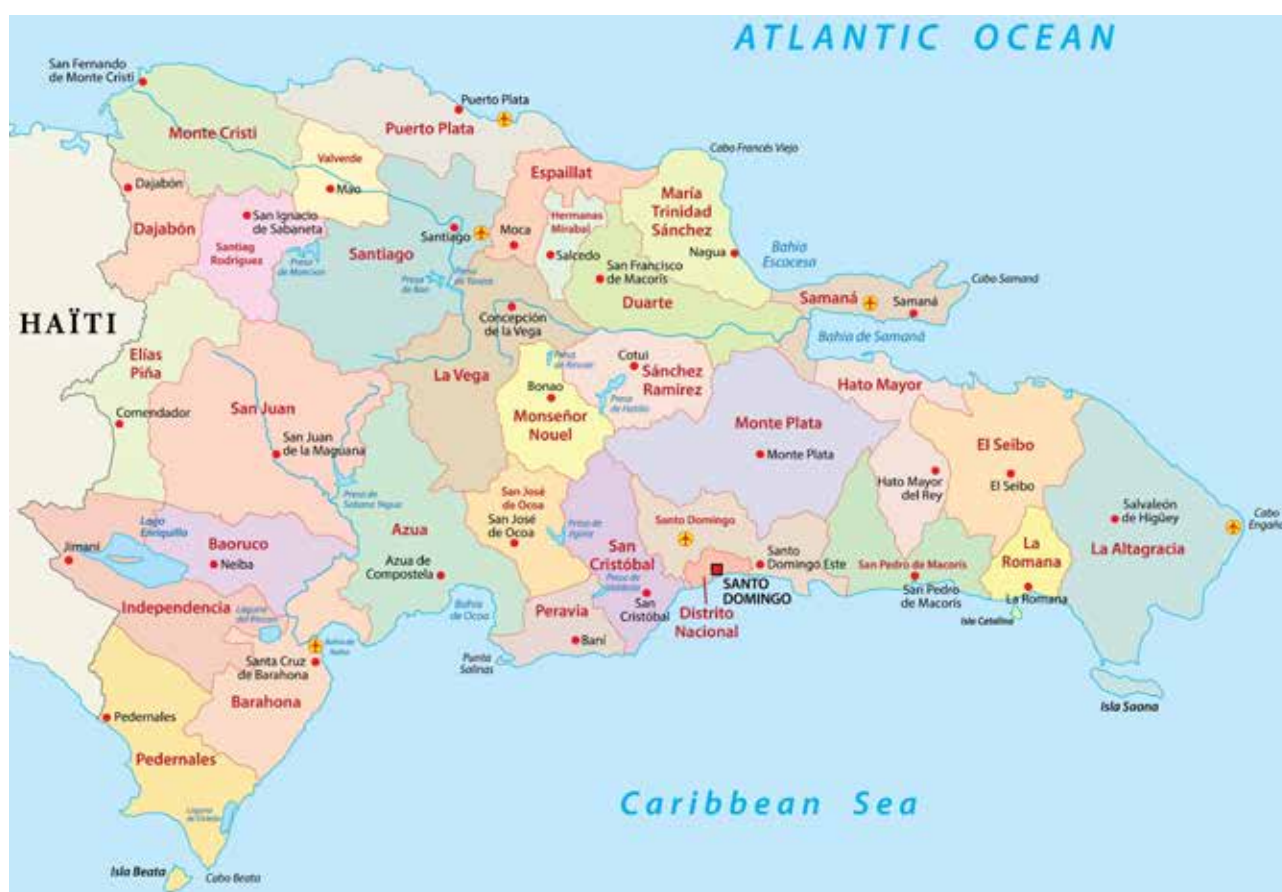


Figure 7. Mango production across the Dominican Republic. Green-circled provinces indicate the main production areas, and orange-circled provinces indicate the other important regions. Source: adapted from WorldAtlas.com.

By initiating flowering as early as January or February, instead of the usual March or April, these farms aim to shift the production peak to a more strategic market window. This period coincides with the tail end of the Peruvian and Ecuadorian seasons, while major producers such as Mexico, India, and Pakistan have yet to reach full production. **By avoiding overlap with peak global supply, this strategy reduces the risk of market saturation** and enables producers to achieve **higher prices** for their mangoes.

Practical outcome: By inducing flowering in mango trees, the harvest period can be strategically adjusted, thereby reducing competition with mangoes from other markets.

2.3 Production challenges

A high percentage of mangoes is **lost at the postharvest stage**, reaching up to 50% depending on mango variety, postharvest

handling and used technologies.¹² Additionally, a substantial part of Dominican mangoes is not harvested at all due to the absence of a market and the lack of a facility for processing them within the country. This loss is estimated at roughly 6.25 million euros in 2021.¹¹

Mango production faces significant challenges due to unpredictable climate conditions, which can severely impact crop consistency. The 2023 season has been one of the toughest mango seasons worldwide. Extreme weather events related to El Niño, such as intense droughts, heavy rainfall, and fluctuating temperatures, affected fruit yields and quality.¹²

These unpredictable climatic patterns hinder the flowering and fruiting cycles of mango

¹¹ Dominican Today. (2021, August 9). Dominican mango glut as foreign market sputters. Dominican Today. <https://dominantoday.com/dr/economy/2021/08/09/dominican-mango-glut-as-foreign-market-sputters/>

¹² Fruitnet. (2023, March 31). Navigating the toughest mango season in decades. Fresh Produce Journal. <https://www.fruitnet.com/fresh-produce-journal/navigating-the-toughest-mango-season-in-decades/260612.article>

trees, leading to inconsistent harvests. In some regions, the lack of sufficient rainfall has exacerbated irrigation issues, further reducing crop reliability. In other regions, the heavy rainfall caused issues with anthracnose, a fungal disease, mostly in the Peravia and San Juan regions. Climate change is expected to impact agricultural productivity in the Dominican Republic, with rainfed crops facing 1% to 20% losses and irrigated crops 3% to 13% by 2050, highlighting the need for improved irrigation and adaptive farming practices.¹³

Practical outcome: Climate change highlights the need for improved irrigation and adaptive farming practices. Flower induction can also be used to avoid peak periods of bad weather.

Mango cultivation in the Dominican Republic is **threatened by various pests and diseases** that compromise tree health and fruit quality. Notably, the **Mango Malformation Disease** (MMD), caused by *Fusarium* species, has been prevalent since 2008, with incidence rates reaching up to 50% in certain regions.¹⁴ This disease leads to malformed flowers and fruits, reducing yield and marketability. Additionally, the **white mango scale** (*Aulacaspis tubercularis*) poses a significant threat, affecting fruit quality and export potential.¹³ **Fruit flies** (Tephritidae) are a very important issue for mango producers, as major markets will not import fruit fly-infested products into their territories.¹⁵ These pests infest ripe mangoes, leading to spoilage and loss of marketable fruits.

In current practices, the import of Mingolo poses challenges with Anthracnose and post-harvest diseases. A European importer

delivering Mingolo mangoes to the French market experienced a bad year in 2024 with high levels of Anthracnose, as post-harvest treatments are not applied to these mangoes. The disease risk is a major concern, and without proper treatments, the product can quickly become unsellable, making it a risky variety to trade.

Practical outcome: Exported mangoes should be free of pests and diseases to enhance market potential and build a strong reputation of high-quality mangoes from the Dominican Republic.

Mingolo mango ripening is currently done by dipping the fruits in ethylene prior to air shipment. However, this method lacks control, often leading to over-ripening or the rapid onset of Anthracnose within a few days. To mitigate these quality concerns, a Dominican exporter highlighted its attempts to adopt a more controlled ripening approach, similar to that used for bananas. This technique involves regulating temperature, humidity, and ethylene levels within sealed ripening chambers. Test shipments from this Dominican exporter include shipping green mangoes that will be ripened upon arrival in the US market. By optimally using container space, combining mango shipments with other shipments to the EU, this could reduce the logistical costs, potentially of interest for more cost-sensitive markets such as retail.

It must be noted that, when consolidating mango shipments with other shipments, this can not be done with fruits as pineapples or bananas due to differences in ethylene sensitivity and storage requirements. Bananas and, to a lesser extent, pineapples, produce ethylene in large quantities and exposure to this gas can lead to premature ripening, softening, and spoilage of the mangoes. Additionally, optimal storage temperatures and humidity levels vary significantly between these fruits, making shared transport conditions unsuitable. To maintain product quality and extend shelf life, mangoes should always be transported separately from high ethylene-producing fruits under tailored storage conditions.

13 "World Bank. (2023). Country Climate and Development Report: Dominican Republic. World Bank Group."

14 Singh, P., Kumar, A., Yadav, M., & Dinesh, M. (2020). Mango malformation: Etiology, symptoms, distribution, and cultivar susceptibility in India. PMC National Center for Biotechnology Information. <https://pmc.ncbi.nlm.nih.gov/articles/PMC9074891/?utm>

15 CBI (Centre for the Promotion of Imports from developing countries). (n.d.). Mangoes: Market entry. CBI. Retrieved January 27, 2025, from <https://www.cbi.eu/market-information/fresh-fruit-vegetables/mangoes/market-entry>

Ripening mangoes in the EU also presents additional challenges. Therefore, this option should be thoroughly assessed before implementation. While ripening in the EU extends shelf life and ensures more consistent fruit quality, it also involves higher logistical costs, as ripening mangoes in Europe is considered expensive.¹⁷ Moreover, expert interviews revealed that the best flavour of mangoes is typically achieved through tree-ripening, which is more difficult to replicate through artificial ripening methods.

Practical outcome: Explore the possibilities of controlled ripening protocols to enhance shelf life, increase quality and enable sea freight. Sea freight can offer significant cost advantages (attractive for retail markets), especially if the Dominican mangoes are used to optimise container space by consolidating shipments with other shipments.

2.4 Postharvest

Most Dominican mangoes are initially stored in ambient conditions at collection points or warehouses before being transported to either local markets or export facilities.¹⁶ Smallholder farmers often lack access to cold storage, which can lead to undesired ripening and higher spoilage rates. Larger exporters have better infrastructure, including temperature-controlled warehouses and refrigerated transport, but their availability is still restricted, **limiting the overall effectiveness of the supply chain.**

Local distribution primarily relies on trucks operating at ambient temperatures, which can suffice for short distances but pose challenges during warm weather. For export, mangoes are typically shipped in refrigerated containers at approximately 12°C to slow ripening and maintain quality. Air transport, while a viable option for premium mangoes, is costly and reserved for high-value markets in Europe

and the USA.¹⁵

2.4.1. Challenges and Quality Risks in the Supply Chain

Several risks affect mango quality along the supply chain. Mechanical damage during harvesting, packaging, and transport increases susceptibility to decay.¹⁵ Rough handling, overpacking, and lack of cushioning in crates often result in bruising. Inconsistent temperature control further complicates storage and transport, leading to chilling injuries below 10°C or premature ripening at higher temperatures.

Another major concern is postharvest disease management. Without proper treatments, fungal infections like anthracnose and stem-end rot can spread rapidly in humid conditions.¹⁵ The lack of training among farmers and transport operators on best handling practices exacerbates these issues, increasing postharvest losses. Additionally, infrastructure limitations, including inadequate cold storage facilities, unpaved roads, and unreliable electricity, present logistical challenges that hinder efficient distribution. Furthermore, due to the short shelf life of the selected mango varieties from the Dominican Republic, it is essential to coordinate thoroughly with all stakeholders in the supply chain prior to transport. All logistical arrangements must be in place in advance to ensure immediate pickup upon arrival; every hour is critical to deliver a high-quality product on the market.

2.4.2. Solutions and Feasibility

Practical outcome: The value chain can be further strengthened by training on best handling practices and improvement of the cold chain facilities.

Practical outcome: Secure fast and reliable supply chains by aligning all logistics beforehand to avoid delays and maintain product quality.

¹⁶ Le, T. D., Viet Nguyen, T., Muoi, N. V., Toan, H. T., Lan, N. M., & Pham, T. N. (2022). Supply chain management of mango (*Mangifera indica* L.) fruit: A review with a focus on product quality during postharvest. *Frontiers in Sustainable Food Systems*, 5, 799431. <https://doi.org/10.3389/fsufs.2021.799431>

To reduce postharvest losses and improve the export readiness of mangoes, the following postharvest technologies and treatments are currently applied in the mango supply chain:

- **Cold storage (10-13°C):** Cold storage significantly reduces the respiration rate of mangoes and extends their postharvest shelf life and marketability by slowing down ripening and senescence processes. Cold storage is currently applied in the Dominican Republic, especially by larger players on the mango export market, but remains largely underdeveloped, particularly in northern regions, as well as remote and rural areas. Small and medium-sized mango producers face limited access to pre-cooling, refrigerated storage, and cold transport. As a result, most fruits are transported in unrefrigerated trucks, greatly reducing fruit quality. Furthermore, in 2024, it was estimated that only 10% of the Dominican Republic's total cold storage capacity potential is currently being utilised, underscoring substantial room for growth.¹⁷ In developed markets, cold chain traceability is becoming an essential requirement. Expanding the availability and use of cold logistics and storage infrastructure throughout the supply chain could significantly reduce postharvest losses and improve export competitiveness.
- **Hot Water Treatment (HWT):** HWT is a cost-effective method to control postharvest diseases. Time-temperature parameters should be carefully adjusted to the mango weight and variety, avoiding fruit damage.^{4,5} All mangoes destined for the US market must undergo hot water treatment to ensure they are free from fruit flies according to USDA guidelines. This process is already applied in the Dominican Republic. This process is only applicable to mature-green mangoes as ripe fruits would suffer from softening, spoilage and flavour loss. Hence, this method would be unsuitable for ripe, premium niche mangoes. The European Union does not specifically mandate such treatment but requires the mangoes to be free from fruit flies.
- **Adjusting storage conditions:** Modified Atmosphere Packaging (MAP) helps retain firmness and minimises weight loss. A study on Ataulfo, Tommy Atkins and Kent mangoes to the US showed that mangoes packed in MAP bags maintained a higher fruit quality and eliminated corte negro symptoms compared to the control mangoes.¹⁸ Currently, mangoes are rarely packed using MAP. Another possibility to extend shelf life would be to use controlled atmosphere (CA) chambers during transport, where temperature, humidity and gaseous concentrations are controlled.¹⁹ Optimal CA conditions vary between varieties. It must be noted that no publicly available sources or documentation were found indicating that CA storage or MAP packaging is currently widely applied in the mango industry of the Dominican Republic. Furthermore, it could be that applying such advanced technologies at a small scale increases the cost price significantly and could potentially price the product out of the market.
- **Natural coatings (e.g., beeswax, carnauba wax, shellax or microcrystalline wax):** Research projects and pilot programs show positive results of the use of these edible coatings to delay ripening and reduce microbial spoilage. Increasing the adoption of these solutions could significantly enhance mango quality and reduce postharvest losses across the supply chain.¹⁵ The use of such coatings is under continuous development and has not yet been applied to Dominican mangoes. However, it has already been

17 Alhambra Advisors. (2024). LatAm cold chain: A way to go. Case study in Dominican Republic [PDF]. https://alhambraadvisors.com/wp-content/uploads/2024/10/AIA_LatAms-Cold-Chain.pdf

18 Brecht, J. K., & Sargent, S. A. (2016). Demonstrating modified atmosphere packaging (MAP) feasibility for mango export (Final Report). National Mango Board. https://www.mango.org/wp-content/uploads/2017/10/Demonstrating_the_Feasibility_of_MAP_Final_Report_Eng.pdf

19 Singh, Z., & Zaharah, S. S. (2015). Controlled atmosphere storage of mango fruit: Challenges and thrusts and its implications in international mango trade. In *Acta Horticulturae* (Vol. 1066, pp. 165–174). International Society for Horticultural Science. <https://doi.org/10.17660/ActaHortic.2015.1066.21>

applied by a Dutch importer and two Peruvian mango exporters. An important note is that when mangoes are sold as organic, the coating should be organic too.¹⁷

- **Irradiation:** Food irradiation is the process of briefly treating food with ionising radiation for a controlled period of time to eliminate or neutralise harmful bacteria, microorganisms, or pests, including fruit flies. This treatment takes place in a designated facility, and the food does not come into direct contact with the radiation. Since 2002, it has been permitted on the US market to irradiate mangoes, in contrast to the EU market, where this is not (yet) approved for fruits.²⁰ Export countries, including Mexico and India, already apply this method as it is suitable for ripe and premium mangoes. Additionally, colour, texture and aroma are better retained using irradiation compared to HWT.²¹ This process can only take place in USDA-certified irradiation facilities. In the Dominican Republic, no irradiation plants are currently certified. Additionally, establishing such a facility requires a significant financial investment, including specialised infrastructure, regulatory approval, and ongoing operational oversight.

2.5 Production prospects

To address the growing demand for Mingolo mangoes, technical investments are needed. Hence, the Dominican Republic invested in six hydro-technological facilities and advanced irrigation systems in 2024,

located in Moca, Navarrete, and Peravia.^{22,23,24} These investments aim to improve water management, enhance productivity, and increase sustainability in mango farming. As agricultural technology adoption remains low, this sector offers strong opportunities for investors.⁹ The improvements in irrigation and water efficiency are expected to boost mango production, reduce operational costs and support competitive pricing while promoting environmental sustainability in mango production. Additionally, production becomes less dependent on seasonal rainfall variations, as the weather can be unpredictable, and irrigation is critical for consistent crop yields.²⁵ Consumer preferences are increasingly driven by concerns around sustainability and product quality, with a marked rise in interest in organic and fair-trade offerings.⁹ Consumers are also demonstrating a willingness to pay premium prices for organic products. However, according to expert interviews, the organic mango segment is not considered attractive for mainstream retail due to its shorter shelf life compared to conventional mangoes and inconsistent year-round availability. Furthermore, retailers in Europe are generally unable to pay premium prices for organic mangoes. As a result, organic mangoes are better suited for niche markets and speciality retailers. The Dominican Republic has already made substantial efforts in organic agriculture and is recognised as a key exporter of organic food products.

20 Animal and Plant Health Inspection Service. (2002, October 23). Irradiation phytosanitary treatment of imported fruits and vegetables. Federal Register, 67(205), 65016–65029. <https://www.federalregister.gov/documents/2002/10/23/02-27027/irradiation-phytosanitary-treatment-of-imported-fruits-and-vegetables>

21 National Mango Board. (2014). Alternatives to hot water treatment: Final report. National Mango Board. https://www.mango.org/wp-content/uploads/2017/10/Alternatives_to_Hot_Water_Treatment_Final-Report.pdf

22 Fruitrop. (2016). Dominican mango. Fruitrop. Retrieved from <https://www.fruitrop.com/en/Articles-by-subject/Full-country-profile/2016/Dominican-mango>

23 Netherlands Enterprise Agency. (2024). Dominican Republic Agricultural Sector Report 2023. <https://www.rvo.nl/sites/default/files/2024-01/DR%20Agro%20Sector%20Report%202023.pdf>

24 Dominican Today. (2021, August 9). Dominican mango glut as foreign market sputters. Dominican Today. <https://dominantoday.com/dr/economy/2021/08/09/dominican-mango-glut-as-foreign-market-sputters/>

25 World Bank. (n.d.). Dominican Republic: Leading the change we need. World Bank. <https://www.worldbank.org/en/programs/lac-green-growth-leading-the-change-we-need/dominican-republic?>

3. TRADE

To understand the potential for the three selected mango varieties, it is essential to analyse the broader mango market and determine how the Dominican Republic positions itself within it. This includes assessing seasonality patterns and identifying which countries supply the European market during the same months the Dominican Republic exports.

3.1 Summary

Main facts:

- Global mango exports are dominated by Mexico, Thailand, Brazil, Peru, and India; the Dominican Republic accounts for 1% (between 2014-2023).
- The main export destinations for Dominican mangoes are the Netherlands (40%), the UK (27%), and the USA (11%). In the Netherlands and the UK, key competitors include Brazil and Peru.
- Dominican Republic's main mango export season is May–August, peaking in June and July.
- This season shows lower total imports and more diverse sourcing. Main competing countries during this window are Brazil (all four months), Côte d'Ivoire (May), Senegal (July and August), Israel (August), Mali (May), Burkina Faso (May), and Peru (May).
- Mainstream competitors dominate with Kent, Keitt, Tommy Atkins, and Palmer, available for many months in the year.
- Several niche varieties compete with the selected varieties from the Dominican Republic because they are already present in the niche markets (Omer/Kasture, Valencia Pride, Alphonso, and Sindhri), are actively promoted (Ataulfo), are emerging (Maya/Aya) or are already present though at lower volumes (Shelly, Chausa, and Totapuri).

Practical outcomes:

- In the Dominican Republic's largest export markets, the Netherlands and the UK, key competitors include Brazil and Peru.
- Maintain reliable logistics and strict fruit fly management to ensure consistent supply and strengthen competitiveness against Senegalese mangoes in the European market.
- The Valencia Pride, grown in Mali and Burkina Faso, is a strong competitor for niche mangoes from the Dominican Republic with coinciding harvest seasons.
- Ataulfo is a strong competitor for niche mangoes from the Dominican Republic with coinciding harvest seasons (Mexico) and (almost) year-round availability.



Figure 8. Summary of Chapter 3, including the practical outcomes mentioned in the chapter (displayed in orange).

3.2 Global competition

Globally, mango exports are divided, and five key countries dominate the export of fresh and dried guavas, mangoes, and mangosteens (HS code 080450), as shown in Table 3. Among these, **Mexico** (17%), **Thailand** (14%), **Brazil** (10%), **Peru** (10%), and **Netherlands** (8%) have the largest share of global exports between 2020-2023. The Dominican Republic accounted for 1% of the total export under HS code 080450 in this time frame. The CAGR for Dominican Republic increased by 10% between 2014 – 2023 while that for the world increased by 4% during the same period.

Table 3. The top 5 exporting countries and the Dominican Republic for fresh and dried guavas, mangoes, and mangosteens (HS 080450) 2014 - 2023, by volume (tonnes) and their exports' Compound Annual Growth Rate over the same period (CAGR). Source: COLEAD based on CEPII BACI, IFPRI, Eurostat and UK Trade Info.

Rank	Country	Exported Volume 2014	Exported Volume 2023	Share of global exports (avg. 2020-2023)	CAGR (2014-2023)
1	Mexico	286,500	459,851	17%	5%
2	Thailand	204,601	371,846	14%	6%
3	Brazil	139,525	276,764	10%	7%
4	Peru	132,159	224,570	10%	5%
5	Netherlands	110,313	222,582	8%	7%
18	Dominican Republic	14,214	25,904	1%	10%
	Total	1,661,150	2,455,821	100%	4%

It should be noted that these figures are not exclusively related to fresh mango exports, as the trade data under HS codes includes fresh and dried guavas, mangoes, and mangosteens. Since fresh mangoes are the biggest contributor to this product group, this product group will be referred to as 'mangoes' to facilitate easy reading.

Additionally, the numbers do not always fully reflect domestic production that is exported. For instance, the Netherlands, while not producing mangoes itself, serves as a major re-export hub for Europe. Similarly, Vietnam, despite having significant mango production, also acts as a regional trade hub, meaning its exports can include a mix of mangoes produced domestically and those sourced from neighbouring countries.

The Dominican Republic mainly **exports to the Netherlands**, the **UK**, and the **USA** (Table 4). Especially, the Netherlands is a main export destination (36%). The UK (22%) is also among the top export destinations for the mangoes from the Dominican Republic.

Table 4. Main 6 export destinations for fresh and dried guavas, mangoes, and mangosteens (HS 080450) of the Dominican Republic 2014 - 2023, by volume (tonnes) and the destination's flow's Compound Annual Growth Rate over the same period (CAGR). Source: COLEAD based on CEPII BACI, IFPRI, Eurostat and UK Trade Info.

Rank	Country	Exported Volume 2014	Exported Volume 2023	Share of Dom. Rep. exports (avg. 2020-2023)	CAGR (2014-2023)
1	Netherlands	5,327	14,503	36%	11%
2	United Kingdom	3,478	8,326	22%	9%
3	United States	867	8,160	22%	25%
4	Canada	824	1,142	4%	3%
5	France	524	802	3%	4%
6	Norway	637	800	2%	2%
	Total	14,214	37,104	100%	10%

Given the importance of the Netherlands as an importing country of mangoes from the Dominican Republic, it is interesting to see what the key suppliers to this market are (Table 5). The main suppliers for the Netherlands over the years 2022-2024 were Brazil (43%) and Peru (30%). The Dominican Republic accounted on average for 5% of the supply during this period.

Table 5. Main supplying origins to the Netherlands for fresh and dried guavas, mangoes, and mangosteens (HS 080450) 2014 - 2024, by volume (tonnes) and the origin's flow's Compound Annual Growth Rate over the same period (CAGR). Source: COLEAD based on CEPII BACI, IFPRI, Eurostat and UK Trade Info.

Rank	Country	Exported Volume 2014	Exported Volume 2024	Share of exports to the Netherlands (avg. 2022-2024)	CAGR (2014-2024)
1	Brazil	62,274	121,770	43%	7%
2	Peru	49,255	47,220	30%	-0.4%
3	Côte d'Ivoire	10,322	14,848	5%	4%
4	Dominican Republic	5,327	13,343	5%	10%
5	United States	6,197	4,858	2%	-2%
6	Senegal	3,182	882	2%	-12%
	Total	162,155	237,123	100%	4%

The **UK** is also a key market for the Dominican Republic. Again, **Brazil** (25%) and **Peru** (13%) were **important suppliers** of mangoes on the market between 2022-2024 (Table 6). The Dominican Republic accounted for an average supply of 9% during this period.

Table 6. Main supplying origins to the UK for fresh and dried guavas, mangoes, and mangosteens (HS 080450) 2014 - 2024, by volume (tonnes) and the origin's flow's Compound Annual Growth Rate over the same period (CAGR). Source: COLEAD based on CEPII BACI, IFPRI, Eurostat and UK Trade Info.

Rank	Country	Exported Volume 2014	Exported Volume 2024	Share of exports to the UK (avg. 2022-2024)	CAGR (2014-2024)
1	Brazil	8,764	23,390	25	10%
2	Peru	11,580	6,710	13	-5%
3	Pakistan	2,541	7,136	8	11%
4	Dominican Republic	3,478	6,932	9	7%
5	Netherlands	4,577	5,600	7	2%
6	India	642	7,521	6	28%
	Total	58,262	88,170	100	4%

3.3 Seasonality

To determine the market potential of the selected varieties from the Dominican Republic in Europe, it is important to understand which countries have overlapping mango seasons with that of the Dominican Republic.

Monthly imports of the EU of fresh and dried guavas, mangoes, and mangosteens show the seasonality of the mango supply (Figure 8). The figure shows that **Brazil is a dominant supplier throughout the year**, with particularly high volumes in the last quarter. Total imports are significantly lower from **June to October**, with more **diverse sourcing** during this period. This partly overlaps the period that the **Dominican Republic** is supplying mangoes to the EU market, with a peak in **June and July**.

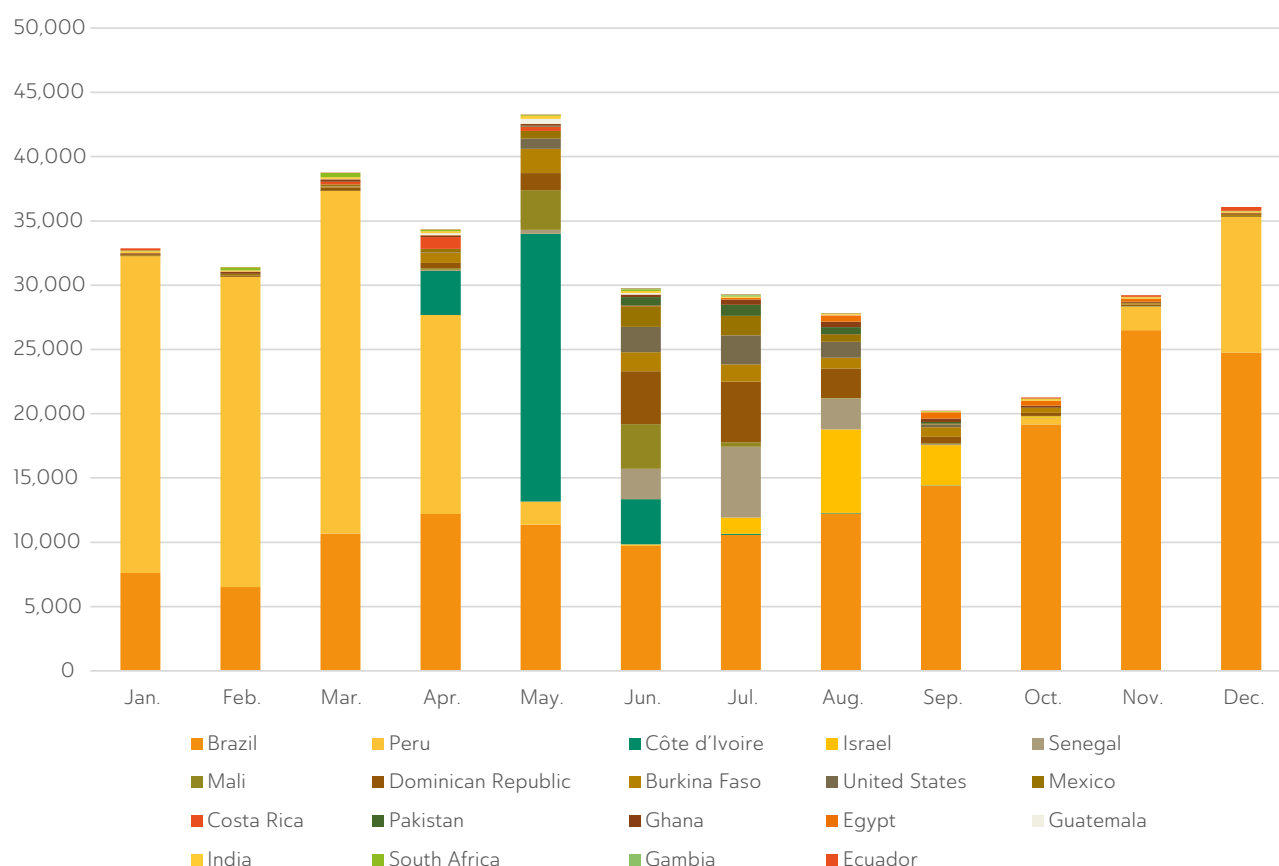


Figure 9. Average export seasonality to the EU for fresh and dried guavas, mangoes, and mangosteens (HS 080450) (2019-2024) by exporting country in volume (tonnes). Source: based on Eurostat.

The Dominican Republic exports mangoes throughout the year, though its main export months are May, June, July, and August (Table 7).

Table 7. Average export seasonality to the EU for fresh and dried guavas, mangoes, and mangosteens (HS 08450) (2019-2023) for the Dominican Republic by volumes (tonnes). Source: based on Eurostat.

Country	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dominican Republic	43	99	260	403	1,334	4,106	4,731	2,278	486	240	126	33

Zooming in on these months indicates that the main countries overlapping with the mango season in the Dominican Republic are Brazil, Côte d'Ivoire, Senegal, Israel, Mali, Burkina Faso, Mexico, Peru, Pakistan, and India (Table 8). Especially Brazil (all four months), Côte d'Ivoire (May), Senegal (July and August), Israel (August), Mali (May), Burkina Faso (May), and Peru (May) are strong competitors.

Table 8. Average export seasonality to the EU for fresh and dried guavas, mangoes, and mangosteens (HS 080450) (2019-2024) for the main exporting months of the Dominican Republic, reflecting the main exporters in these months by volume (tonnes). **Numbers in bold highlight the exporting countries that export more volume compared to the Dominican Republic in the respective month. Source: based on Eurostat.**

Country	May	Jun	Jul	Aug
Brazil	11,360	9,725	10,563	12,245
Côte d'Ivoire	20,832	3,496	80	43
Dominican Republic	1,334	4,106	4,731	2,278
Senegal	296	2,363	5,520	2,385
Israel	11	9	1,260	6,494
Mali	296	2,363	5,520	2,385
Burkina Faso	1,883	1,479	1,343	845
Mexico	789	1,990	2,245	1,247
Peru	1,807	129	13	9
Pakistan	71	652	852	547
India	380	125	12	30

According to importers and exporters that have been interviewed, **Senegalese** mangoes are generally valued in European markets due to their higher sweetness, although their **supply is often inconsistent**. Availability can abruptly decline with the onset of the rainy season or outbreaks of fruit fly infestations. During such periods of scarcity, **European importers tend to shift to alternative sources**, including the Dominican Republic. Moreover, Dominican mango producers benefit from more robust logistics, with reliable freight schedules and consistently implemented fruit fly protocols, offering greater supply stability compared to their Senegalese counterparts.

Practical outcome: Maintain reliable logistics and strict fruit fly management to ensure consistent supply and strengthen competitiveness against Senegalese mangoes in the European market.

3.4 Main competitors

Based on the seasonality (Table 8), it is relevant to zoom in on the following countries, which

can be considered the main competitors for the Dominican mango export:

- Brazil
- Côte d'Ivoire
- Senegal
- Israel
- Mali
- Burkina Faso
- Mexico
- Peru
- Pakistan and India

Brazil has seen a significant growth in exports in the past ten years. In 2023, Brazil's mango production was estimated at around 2.2 million metric tonnes, showing a steady increase over the years and doubling compared to 2014.²⁶ In 2022, however, there was a dip in production due to heavy rainfall.²⁷ In 2023, roughly 266,000 tonnes of production were exported, mainly to the Netherlands (45%), followed by the USA and Spain (both 18%).⁵ The most cultivated and exported mango variety in Brazil is the **Tommy Atkins**, responsible for 81% of exports in the 2022-2023 season, followed by Palmer, Kent and Keitt.^{21,28} Between January and July 2023, exports to the USA declined due to intense competition from Mexican mangoes and difficulties in meeting phytosanitary regulations, especially regarding fruit flies.²¹ In response, Brazil has implemented innovative technologies such as artificial intelligence, automated traps, and the use of a Sterile Insect Technique (SIT) to effectively manage fruit fly infestations.²⁴

Côte d'Ivoire and **Senegal** are the main mango exporters in West Africa. Côte d'Ivoire

26 Produce Blue Book. (2024, August 28). Brazil begins to export mangoes to the U.S. Produce Blue Book. Retrieved January 28, 2025, from <https://www.producebluebook.com/2024/08/28/brazil-begins-to-export-mangoes-to-the-u-s/>

27 Tridge. (2023). Brazil Mango Report 2023. Tridge. Retrieved January 27, 2025, from https://cdn.tridge.com/market_report_report/db/c3/ab/dbc3ab9eea005b0bd1661ebd720434601a38ea5/Brazil_Mango_Report_2023_1.pdf

28 Frutas do Brasil. (n.d.). Mango. Retrieved January 28, 2025, from <https://frutasdobrasil.org/en/fruta/manga/#::~:~:text=The%20most%20exported%20varieties%20are,by%20the%20fruit%20growing%20economy>

ships around 27,000 tonnes annually to its main market, the EU, and Senegal about 12,000 tonnes. The main export season for Côte d'Ivoire spans from late March to July, offering a supply in a period of more diverse sourcing on the European markets. Senegalese exports complement those of Côte d'Ivoire by covering a slightly later window in the mango season, running from May through August. Both countries have an added advantage of being close to Europe in terms of transit time, benefiting from the possibility to ripen fruit fairly long on the trees, offering a better taste.¹⁶ The regional variety Amélie used to be the main West African export variety, but the **Kent** and **Keitt** have taken over this position. The presence of **Amélie** is quickly declining on the EU market, possibly due to its more limited shelf life.²⁹ Other exported varieties are Palmer, Zill, and Irwin, though challenges limit these varieties from being the most exported variety, such as the smaller size of the Palmer (300-450g) and the shorter shelf life of the Zill and Irwin.^{30,31}

Israel exports a significant volume of mangoes to the EU, especially in its peak month of August. These shipments directly overlap with those from the Dominican Republic. Israel's total EU export stands at about 10,848 tons, with a production of 16,400 tons.³² The Kent, Keitt, Omer/Kasturi, Shelly and the Maya/Aya mango varieties are exported to the EU from Israel. The **niche varieties Omer/Kasturi, Shelly and Maya/Aya** are only produced and exported by Israel; these varieties are developed as part of Israel's advanced breeding program, which has

been in progress for almost 40 years and specifically targets the European market.³³ These unique Israeli niche varieties are prized for their flavour, attractive appearance, and good shelf life, helping Israel serve a **premium segment** in the competitive EU market. Despite its relatively small production volume compared to global leaders, Israel's focus on **quality** and **introducing new niche varieties** allows it to command strong prices and loyal buyers in Europe.³¹ These Israeli mangoes form a direct competitor for the Dominican niche mangoes, as these mangoes are available from the end of June until the end of August, with slight differences between varieties.

Mali is emerging as a notable competitor in the European mango market, especially during the early season. Mali is currently **the leading producer of mangoes in Africa**, with over 800,000 tonnes of mangoes being produced in 2024.³⁴ However, only 11,000 tonnes of these mangoes were exported, most of them destined for the EU market. The main **challenges currently hindering the export** of this product are the long distance to the available ports (Abidjan or Dakar) and the absence of a reliable cold chain.³⁰ The country's main export variety to Europe is **Kent**.³⁵ Additionally, Mali exports **Valencia Pride**, a niche variety known for its large size, but with a short seasonality (late June to August).³¹ Despite these challenges, Mali's strong early-season volumes and unique varieties help it maintain a competitive position alongside other African suppliers like Côte d'Ivoire and Senegal.

Burkina Faso is a growing force in West African

29 Centre for the Promotion of Imports from developing countries (CBI). (2023, July 12). What is the market potential for mangoes in Europe? <https://www.cbi.eu/market-information/fresh-fruit-vegetables/mangoes/market-potential>

30 Serge, G. S., Mélanie, A. C., & Abdoulaye, T. (2021). Morphological, Physical and Biochemical Characteristics of the three Main Varieties of Mango (*Mangifera indica* L.) Cultivated in the Poro Region (North of Côte d'Ivoire). *Asian Food Science Journal*, 20(11), 142–153. <https://doi.org/10.9734/afsj/2021/v20i1130383>

31 Rey, J., Diallo, T. M., Vannière, H., Didier, C., Kéita, S., and Sangaré, M. The mango in French-speaking West Africa: varieties and varietal composition of the orchards. *Fruits, The International Journal of Tropical and Subtropical Horticulture*, (57–73), CABI. <https://doi.org/10.1051/fruits/2006051>

32 FreshPlaza. (2024, May 22). Israeli mango exports grow. FreshPlaza. <https://www.freshplaza.com/north-america/article/9715147/israeli-mango-exports-grow/>

33 Ministry of Agriculture and Rural Development – Israel. (2025, January). Set of elite new Israeli mango cultivars (AgroIsrael 10/16). <https://www.agri.gov.il/wp-content/uploads/2025/01/Set-of-elite-New-Israeli-Mango-Cultivars-AgroIsrael-10-16.pdf>

34 FreshPlaza. (2024, May 15). Mali could become an important supplier of mangoes. FreshPlaza. <https://www.freshplaza.com/north-america/article/9711566/mali-could-become-an-important-supplier-of-mangoes/>

35 Centre for the Promotion of Imports from developing countries (CBI). (2023, July 12). What is the market potential for mangoes in Europe? <https://www.cbi.eu/market-information/fresh-fruit-vegetables/mangoes/market-potential>

mango exports, specialising particularly in organic mangoes. The country produced 17,000 tonnes of mangoes, most of these destined for the Moroccan market.^{32,33} The main export season begins early, often from March to August. This **early window** gives Burkina Faso a competitive edge before other West African countries like Mali and Côte d'Ivoire ramp up their exports. Additionally, it overlaps with Ramadan, providing a significant market opportunity.³⁶ Burkina Faso grows several mango varieties such as **Kent, Valencia Pride and Amélie**. Kent is favoured for fresh exports, while Amélie's presence on the EU market is declining as mentioned above.³¹ Despite challenges such as price pressures and strict EU import standards, Burkina Faso maintains its position as an important **organic mango supplier** to Europe, leveraging its early season and strong processing sector.³³ Efforts are being made to improve access to Moroccan ports for landlocked Sahel countries, which could enhance the competitiveness of Burkina Faso's exports to Europe.³²

Practical outcome: The Valencia Pride, grown in Mali and Burkina Faso, is a strong competitor for niche mangoes from the Dominican Republic with coinciding harvest seasons.

As the world's largest exporter of mangoes, **Mexico is a major competitor for the Dominican Republic**, exporting more than 460,000 tonnes in 2023. In the same year, Mexico produced over 2.5 million tonnes of mangoes, with significant exports to the USA, Canada, and Europe.³⁷ Mexico's competitive advantage lies in its well-established infrastructure, extensive production regions, extended production season and offering a large variety of mango types³⁸. Additionally, Mexico is the number one supplier of mangoes to the USA. Mexico is

picking up on the organic trend as production increased from 13,758 metric tonnes in 2018 to 32,388 in 2022.²⁵ Among Mexico's key export varieties are **Tommy Atkins, Kent, Keitt**, and the highly prized **Ataulfo** mango.

The Ataulfo is known for its smooth, non-fibrous texture, rich sweetness, and distinctive golden-yellow skin. The Ataulfo mango is being **actively promoted in Europe**. Mexican exporters and authorities have launched campaigns and events in the EU to boost consumer awareness and import volumes of this premium variety. As the Mexico-EU trade agreement advances, the Ataulfo mango's market share and reputation as a high-quality, ready-to-eat fruit are expected to grow further in Europe. Leading European importers and retailers, including Dole, supply Ataulfo mangoes in Europe almost year-round, from February to December.³⁹ This is due to overlapping harvest seasons in Mexico (February to early August), Brazil (July to December), and Ecuador (late September to December).⁴⁰ Hence, (Mexican) Ataulfo serves as a **direct competitor** for Dominican niche varieties as the Mexican season overlaps (June and July) and the almost year-round availability of the Ataulfo. This makes it an attractive mango for retailers.

Practical outcome: Ataulfo is a strong competitor for niche mangoes from the Dominican Republic with coinciding harvest seasons (Mexico) and (almost) year-round availability.

Peru is a strong player in the global export market. Peru produced more than 567,000 tonnes in 2023. About 36% of its export volume is exported to the Netherlands and 34% to the USA.²³ More than 90% of all exports concern

36 FreshPlaza. (2024, May 30). "We prefer to turn to processing or markets like Morocco for our fresh organic mangoes". FreshPlaza. <https://www.freshplaza.com/north-america/article/9722050/we-prefer-to-turn-to-processing-or-markets-like-morocco-for-our-fresh-organic-mangoes/>

37 International Trade Centre. (z.d.). Trade Map. <https://www.trademap.org/Index.aspx>

38 International Society for Horticultural Science (ISHS). (n.d.). Mango production and marketing in Mexico. International Society for Horticultural Science. Retrieved January 27, 2025, from https://www.ishs.org/ishs-article/455_7

39 Dole plc. (2025, March 19). Dole launches DOLE® Exotic Selection Ataulfo Mango across EMEA. <https://www.doleplc.com/news/company-news/company-news-details/2025/Dole-Launches-DOLE-Exotic-Selection-Ataulfo-Mango-across-EMEA/default.aspx>

40 FreshPlaza. (2024, June 3). Ataulfo, the mango with designation of origin, aims for Europe. FreshPlaza. <https://www.freshplaza.com/north-america/article/9728041/ataulfo-the-mango-with-designation-of-origin-aims-for-europe/>

the Kent variety, followed by **Ataulfo, Keitt and Edward**.⁴¹ Mango production in Peru has consistently grown between 2014 and 2022, with exports doubling in 2022 compared to 2014. However, in the 2023-2024 season, Peru faced challenges that led to a significant reduction in mango exports, with a 67% decrease compared to the previous season. High temperatures and heavy rainfall due to the Coastal and Global Niño, as well as Cyclone Yaku, greatly affected production and infrastructure.²⁶ Peru's sea freight season generally peaks from **November to April**, hence Peruvian mangoes enter the market before those from other Latin American countries, giving them an **early advantage** in global exports.¹⁴ Peru's airfreight season starts earlier and runs from **mid-October to May**. The export season for Peru extended over the years because of strategic production, where timing and quality of the mangoes are optimised to maximise market opportunities in the EU, but also due to changing weather conditions related to climate change.¹⁷

Pakistan is a growing force in the global mango export market, with a reputation for exceptionally sweet, aromatic, and premium-quality mangoes. The country already produces large quantities of mangoes, but only **exports a very small quantity** of production, about 1% of the production was exported to Europe in 2023.³⁵ It currently delivers varieties as **Chausa** and **Sindhri**. **India** grows the increasingly popular **Alphonso**, as well as the **Totapuri**. All these varieties are especially sold on ethnic markets, with a strong market in the UK. The Pakistan mango window begins **mid-May** and runs until the first week of **September**.⁴² Despite challenges such as fruit fly restrictions and quality controls, Pakistan's mango sector is investing in improved logistics and branding to strengthen its presence in

the European market. The lack of compliance and transparency has led to delayed audits, incomplete facility accreditation, and the risk of export bans, severely restricting access to high-value European markets despite strong demand for Pakistan's niche mangoes.

3.5 Main competitive varieties

The table below presents the mango varieties exported by the main competitors during the Dominican Republic's mango season (Table 9). This overview of the different varieties highlights which varieties can be seen as the main competitors to the selected varieties from the Dominican Republic.

The widely distributed Kent, Keitt, Tommy Atkins, and Palmer **dominate European retail markets** due to their favourable balance of sweetness, low fibre content, and long availability, with the Kent and Keitt even being available year-round. In contrast, niche varieties Edward, Amélie, Zill, and Irwin can be seen as less strong competitors for the selected Dominican Republic varieties, either due to a different supply season (Edward) or their challenges with a limited shelf life (Amélie, Zill, and Irwin).

On the other hand, the niche varieties Omer/Kasture, Shelly, Maya/Aya, Valencia Pride, Ataulfo, Alphonso, Chausa, Totapuri, and Sindhri can be seen as stronger competitors for the selected varieties from the Dominican Republic, either because they are already well-presented in the niche markets (Omer/Kasture, Valencia Pride, Alphonso, and Sindhri), are being actively promoted (Ataulfo), are emerging (Maya/Aya) or are already present though at lower volumes (Shelly, Chausa, and Totapuri).

Table 9. *Mango varieties that are exported by the main*

41 Produce Blue Book. (2024, April 3). Peruvian mango exports plummet in the 2023-2024 season. Produce Blue Book. Retrieved January 27, 2025, from <https://www.producebluebook.com/2024/04/03/peruvian-mango-exports-plummet-in-the-2023-2024-season/>

42 Profit by Pakistan Today. (2024, May 15). Pakistan's already restricted mango exports to high-end markets in doldrums. <https://profit.pakistantoday.com.pk/2024/05/15/pakistans-already-restricted-mango-exports-to-high-end-markets-in-doldrums/>

competitors during the Dominican Republic's mango season. Details are listed from top to bottom: country of origin, taste, texture, peel colour, size, shape, season, and market success.

Kent	Keitt	Tommy Atkins
 <p>43</p> <ul style="list-style-type: none"> Brazil, Senegal, Côte d'Ivoire, Israel, Mali, Burkina Faso, Mexico, Peru Sweet taste with hints of sour notes Juicy, tender flesh with limited fibres Green-skinned with a dark red blush over a small portion Average weight of 500g Oval shape Year-round, depending on the origin country Widely exported variety and popular in the EU markets 	 <p>42</p> <ul style="list-style-type: none"> Brazil, Senegal, Côte d'Ivoire, Israel, Mexico, Peru Sweet taste with citrus notes Juicy, firm flesh with limited fibres Green-skinned with a pink blush over a small portion Average weight of 500g Oval shape Year-round, depending on the origin country Widely exported variety and popular on EU markets 	 <p>42</p> <ul style="list-style-type: none"> Brazil, Mexico Sweet taste with hints of citrus & tropical fruit Firm flesh with medium fibres throughout Dark red blush covers most of the fruit Average weight of 460g Oval shape March-July Commonly cultivated export variety. First seen as a fibrous mango, but at the right ripeness level, it is hardly fibrous, better meeting the preferences of most European consumers
Palmer	Amélie	Zill
 <p>44</p> <ul style="list-style-type: none"> Brazil, Senegal, Côte d'Ivoire, Burkina Faso Mild flavoured, buttery smooth with minimal fibre Heavily blushed with a purple to red colouration Average weight 300-450g 	 <p>44</p> <ul style="list-style-type: none"> Senegal, Côte d'Ivoire, Burkina Faso Sweet, slightly sour, and aromatic Silky, smooth, fibreless Yellow with a reddish blush Average weight 250-300g 	 <p>45</p> <ul style="list-style-type: none"> Senegal, Côte d'Ivoire, Burkina Faso Moderately sweet with notes of pineapple Soft and fibreless Yellow-green with a dark red blush Average weight 250-300g

43 Picture source: Mango.org.












































44 Picture source: Good Fruit Guide.

45 Picture source: Jurassic Fruit.

  	<p>Oblong shape</p> <p>April-November, depending on the origin country</p> <p>Popular variety, but in West Africa, its smaller size limits the variety from being the most exported variety</p>	  	<p>Oval to slightly elongated</p> <p>March-June, depending on the origin country</p> <p>Its market position was taken over by Keitt and Kent, possibly because of its shorter shelf life. Often used for dried mango. Often used for dried mango. As fresh produce, its market has been taken over by Kent and Keitt.</p>	  	<p>Oval</p> <p>March-June, depending on the origin country</p> <p>Limited shelf life hinders full market access</p>
Irwin		Omer/Kasture		Shelly	
					
       		       		       	
<p>Senegal, Côte d'Ivoire, Burkina Faso</p> <p>Sweet, aromatic, and mild</p> <p>Soft, tender, juicy, and fibreless</p> <p>Red to reddish-yellow</p> <p>Average weight 250-350g</p> <p>Oval to slightly round</p> <p>March-June, depending on the origin country</p> <p>Limited shelf life hinders market access</p>		<p>Israel</p> <p>Strong sweet flavour</p> <p>Soft, low in fibre</p> <p>Orange-yellow with a red purple blush</p> <p>Average weight 400-600g</p> <p>Oval to round</p> <p>July-September</p> <p>Well-established in niche markets</p>		<p>Israel</p> <p>Sweet and aromatic</p> <p>Firm, buttery, and non fibrous</p> <p>Yellow to red</p> <p>Average weight: 400-600g</p> <p>Round, apple-shaped</p> <p>July-September</p> <p>Popular in niche markets, though with lower volumes than other Israeli varieties</p>	
Maya/Aya		Valencia Pride		Ataulfo	
					
   		   		   	
<p>Israel</p> <p>Very sweet, rich and balanced flavour</p> <p>Silky, smooth, and low in fibre</p> <p>Yellow with a pinkish orange-red blush</p>		<p>Mali, Burkina Faso</p> <p>Sweet and rich flavour</p> <p>Tender, soft, low in fibre Tender, soft, low in fibre</p> <p>Golden yellow sometimes with patches of red pink blush</p>		<p>Mexico, Peru, Brazil</p> <p>Very sweet and creamy</p> <p>Smooth, buttery, and no fibres</p> <p>Bright golden yellow</p>	

46 Picture source: Specialty produce.

47 Picture source: Bud Holland.

   	<p>Average weight 300-400g</p> <p>Round, apple-shaped</p> <p>July-August</p> <p>Emerging variety in niche markets, though it has a very short season</p>	   	<p>Average weight 600-900g</p> <p>Kidney to S-shaped</p> <p>June-August</p> <p>Niche variety known for its large size</p>	   	<p>Average weight 170-280g</p> <p>Small, kidney-shaped</p> <p>February-August (Mexico), July-December (Brazil), November-January (Peru)</p> <p>Actively promoted in Europe, resulting in a well established niche market share</p>
Edward		Alphonso		Chausa/Chaunsa	
 <p>48</p>		 <p>49</p>		 <p>50</p>	
       	<p>Peru</p> <p>Sweet, rich, and a little acidity, creating a balance</p> <p>Smooth, medium firm, and fibreless</p> <p>Golden-orange with a reddish- orange blush</p> <p>Average weight 300-400g</p> <p>Oval to oblong</p> <p>October-December (peak season, in small quantities through the year)</p> <p>Niche market presence, though in a different season compared to the Dominican mangoes.</p>	       	<p>India</p> <p>Very sweet, rich, and aromatic</p> <p>Smooth, buttery, no fibre</p> <p>Bright yellow to orange</p> <p>Average weight 150-350g</p> <p>Oval to round</p> <p>May-July</p> <p>Premium variety in niche (ethnic) markets in Europe, especially the UK.</p>	       	<p>Pakistan, India</p> <p>Sweet and tangy in balance, rich in flavour</p> <p>Smooth, juicy, and fibreless</p> <p>Yellow-green with a reddish blush</p> <p>Average weight 300-350g</p> <p>Oval</p> <p>June-August</p> <p>Popular in niche (ethnic) markets in Europe, though at moderate volumes</p>
Totapuri		Sindhri			
 <p>51</p>		 <p>52</p>			
	<p>India</p>		<p>Pakistan</p>		















48 Picture source: Fruter.

49 Picture source: C&J Gardening Center.

50 Picture source: Earthy Tales.

51 Picture source: Swiggy.

52 Picture source: Chaaidaani

	Mildly sweet, slightly tangy		Sweet and aromatic
	Dense, firm, and fibrous		Smooth, low in fibre
	Greenish-yellow sometimes with a red pink blush		Yellow with an orange blush
	Average weight 300-500g		Average weight 400-500g
	Oblong with prominent pointed tips		Oval with a pointed curve
	May-July		May-June
	Present in niche (ethnic) markets, less appealing to retail due to fibres		Present in niche (ethnic) markets, though at limited volumes. Most popular Pakistani variety

4. PRODUCT REQUIREMENTS EUROPE

4.1 Summary

Main facts

- The Mingolo, Crema de Oro, and Banilejo are relatively unknown by European importers but are open to new varieties if quality and appearance are good.
- There could be market potential for the selected mango varieties from the Dominican Republic, particularly within niche markets.
- In Scandinavian and Northern European markets, pricing is more focused on price per piece rather than price per weight, leaning towards a preference for smaller-sized mangoes.
- Not all consumers in Northern European countries prefer fibrous mangoes. The niche market, such as ethnic supermarkets and speciality stores, is then more suitable.
- In Southern European countries, pricing is focused on price per weight, and consumers are more willing to pay more premium prices for premium fruits.
- Consumers in Southern European countries are often more tolerant of fibrous mango varieties.
- Storytelling is crucial to build a strong reputation for the selected mango varieties, stressing the unique product properties.
- EU quality standards require mangoes to be intact, ripe, clean, and free from pests, with tolerances varying by class (Extra, Class I, Class II).
- Size requirements vary across market channels and country destinations.
- Packaging requirements differ depending on customer needs and market segments, but should always be robust, clean, and appropriate.
- Premium packaging can help to position mangoes as an exclusive product, for example, by individually wrapping fruits in protective socks.
- Certifications like GLOBALG.A.P. and SMETA for primary production are increasingly important, even for niche markets.
- The EU enforces strict pesticide residue limits and phytosanitary requirements, especially for fruit flies.

Practical outcomes:

- Conduct extensive shelf life testing on the selected mango varieties to evaluate their compatibility with more conventional varieties, such as Kent and Keitt.
- Focus on supplying retail and niche markets in Northern European and Scandinavian countries, where there is a clear preference for smaller-sized mangoes. Given its sweeter flavour profile and average weight mostly exceeding 300 grams, the Mingolo variety offers the greatest potential in these markets.
- Focus on supplying niche markets in Southern Europe, such as speciality stores rather than the mainstream supermarket chains. Consumers in these regions are more tolerant of fibrous textures and non-standard sizes.
- Focus on supplying ethnic supermarkets and speciality stores in the UK, particularly those serving the Indian community, where there is strong familiarity with and demand for fibre-rich (e.g. Mignolo) and exotic mango varieties (e.g. Crema de Oro and Banilejo).
- To reach the market, storytelling is crucial. There is a need to position the varieties very well, emphasising their unique characteristics and how they stand out from others.
- Retail demands a minimum weight of 300 grams per piece, making only the Mingolo suitable for this sales channel. Position the selected mango varieties as premium products by maximising tree ripening, using high-quality and distinctive packaging, and opting for airfreight transport.
- Mango growers should be certified for GLOBALG.A.P. as a minimum requirement to gain access to the European market.
- Food safety is an important topic in Europe, and packhouses are therefore required to have food safety and quality management systems in place.
- MRLs in Europe are strict, and most importers require extensive registration of Plant Protection Products (PPP) by growers. Adherence to MRLs is crucial to maintain market access and protect the market's reputation.
- Mango shipments must be accompanied by a phytosanitary certificate adhering to the guidelines.



Figure 10. Summary of Chapter 4, including the practical outcomes mentioned in the chapter (displayed in orange)

4.2 Market preferences

Product preferences vary significantly among markets, even within Europe. In this context, it is worth highlighting a particularly informative **market information brief** on mangoes in European markets, published by **CBI** (Centre for the Promotion of Imports from Developing Countries), an agency of the Ministry of Foreign Affairs of the Netherlands. This brief serves as a valuable complement to the information provided in the following chapter and can be accessed [here](#).

This section evaluates the market preferences for the three main Dominican mango varieties (Mingolo, Crema de Oro, and Banilejo) across key European markets.

Discussions with European importers revealed that the **selected mango varieties** are still **relatively unknown** in these markets. Most importers indicated that they have not yet heard of them, and that they have never been offered these specific varieties. They also indicate this to be the main reason for not importing these varieties. However, the market in general remains **open to new mango types**, and retailers are also open to introducing new varieties, provided the fruit has an attractive appearance and meets consumer taste preferences. Most consumers and importers prefer mangoes with a red blush, which is especially the case in Eastern European markets (e.g. Poland, the Czech Republic).

Where mangoes in Europe were seen as a special, exotic fruit several years ago, it has now found a **steady position in the fruit offerings** in Europe throughout the year, making it a big market. **The Netherlands** acts as a central hub for **bulk imports**, distributing to other markets.

Importers participating in the study indicated that there could be **market potential** for the selected mango varieties from the Dominican Republic, particularly within niche markets. During discussions with exporters, one exporter mentioned that they are already supplying Mingolo mangoes to **speciality shops and ethnic stores in France**, highlighting the market potential for these varieties. Due to their **vulnerability and short shelf life**, these

mangoes are **transported by air**. Once they arrive in Europe, they must be **sold within 2–4 days**, which significantly increases freight costs and positions the selected varieties as higher-priced, niche products. Additionally, all logistical arrangements must be executed on time; even a short delay in transport can significantly impact the quality and marketability of the fruit. Further **shelf life testing** is recommended to assess the compatibility of these selected varieties compared to more conventional mango varieties such as Kent and Keitt.

Practical outcome: Conduct extensive shelf life testing on the selected mango varieties to evaluate their compatibility with more conventional varieties, such as Kent and Keitt.

If mango prices can be kept within reasonable limits, the **Scandinavian and Northern European retail markets** offer good potential. In these regions, pricing is more focused on **price per piece** rather than price per weight, unlike in Southern Europe. As a result, consumer preferences also lean toward **smaller-sized mangoes**, such as the three selected varieties from the Dominican Republic.

One Scandinavian importer mentioned paying €10–15 per 3 kg box for air-freighted mangoes from Thailand, with prices rising to €15–17 per box during peak periods like Christmas. Additionally, consumers in Scandinavia show a strong preference for **sweeter mango varieties**, creating opportunities particularly for the **Mingolo and Banilejo** varieties. However, it is important to note that EU supermarkets require a **minimum mango weight of 300 grams**. Since the Banilejo typically weighs between 150 and 250 grams, it does not have potential in mainstream retail channels. Furthermore, not all consumers in Northern European countries prefer fibrous mangoes. The **niche market**, such as ethnic supermarkets and speciality stores, also offers opportunities for the selected mango varieties in these countries.

Practical outcome: Focus on supplying retail and niche markets in Northern European and Scandinavian countries, where there is a clear preference for smaller-sized mangoes. Given its sweeter flavour profile and average weight mostly exceeding 300 grams, the Mignolo variety offers the greatest potential in these markets.

Importers in Europe indicated especially a market for **niche mangoes** in **South-European countries** like Italy and Spain, given that consumers in such countries are often more willing to **pay more premium prices for premium fruits**. Additionally, these consumers are more **tolerant of fibrous mango** varieties, whereas Northern European markets strongly prefer fibreless types like Kent or Keitt. Also, Russia was mentioned as a country where consumers are more often willing to pay premium prices for good fruits, such as mangoes. Demand for premium fruits in the Netherlands is increasing, though at a slow pace. The disadvantage is only that consumers in countries like Spain and Italy, in general, prefer the **bigger mangoes**, while the selected varieties from the Dominican Republic are relatively small. These countries could, however, potentially be **adaptable to various sizes**. Consumers in South-East Europe, such as Croatia and the Czech Republic, and Scandinavian countries prefer the smaller mangoes, though the mangoes from the Dominican Republic are considered even smaller.

Practical outcome: Focus on supplying niche markets in Southern Europe, such as specialty stores rather than the mainstream supermarket chains. Consumers in these regions are more tolerant of fibrous textures and non-standard sizes.

The **UK market** presents a promising opportunity for the selected varieties from the Dominican Republic, with the Mignolo presenting the strongest opportunity. The UK has a significant Indian community, many of whom have a **stronger preference for fibre-rich** mango varieties. This consumer group is

also familiar with more exotic mango types, making them more open to trying lesser-known varieties like Crema de Oro and Banilejo, especially when air-freighted for optimal freshness. **Air-freighted mangoes** already enjoy popularity in the UK, and the demand is further strengthened during **seasonal celebrations** such as Diwali and Eid, when premium mangoes are traditionally gifted and consumed. Although mainstream UK retailers generally favour large, visually appealing mangoes, **niche markets, ethnic supermarkets, and speciality stores** offer a well-established sales channel for smaller, high-flavour mangoes with a fibrous texture.

Practical outcome: Focus on supplying ethnic supermarkets and speciality stores in the UK, particularly those serving the Indian community, where there is strong familiarity with and demand for fibre-rich (e.g. Mignolo) and exotic mango varieties (e.g. Crema de Oro and Banilejo).

4.2.1. Storytelling

When serving the market and especially the niche market, it is a matter of working on the **reputation of the selected mango varieties**. This is especially crucial given the current low familiarity with the varieties in European markets. For example, when they are mostly presented as fibrous mangoes, the importing market is likely not to show a lot of interest, as fibreless and low-fibre mangoes are generally appreciated by the majority of European consumers.¹⁷ An example is with the Tommy Atkins from Brazil, which was commonly seen as a fibrous mango, therefore not meeting the consumer preferences of the majority of European consumers. However, at the right ripeness level, these fibres are hardly present, still meeting the consumer demands. Therefore, importers emphasised the **importance of storytelling**, expressing a need for exporters and producers to clearly communicate what makes **each variety unique** and how it **stands out from others**. This information could be transferred into

a complete, yet brief, **presentation** about the mango varieties, including information about the farms, fields, a “meet the grower” section, history, and specifications of the mango varieties. It is thus really a matter of storytelling towards importers, to ensure these importers can use such presentations during discussions with their retail clients. When retail or niche customers show interest towards the importers, it is recommended to **send samples** of the selected varieties to a group of targeted importers, allowing them to evaluate and test their market potential.

Practical outcome: To reach the market, storytelling is crucial. There is a need to position the varieties very well, emphasising their unique characteristics and how they stand out from others.

4.2.2. Price trends

Mango prices vary significantly depending on the variety, country of origin, packaging, and mode of transport. In international trade, two common pricing terms are FOB (Free On Board) and CF (Cost and Freight). FOB prices reflect the cost of the goods up to the point of departure from the export country, excluding freight and insurance. In contrast, CF prices include the cost of transport to the destination port, but not insurance.

Table 10. Price estimations for mangoes shipped to the European markets. Kindly note that prices highly depend on availability and seasons.

Type of mango	Free on Board (FOB) in Euros per box	Cost & Freight (CF) in Euros per box
General	€4.50 for 4kg boxes	€5.30 for 2kg boxes by air
Keitt from the Dominican Republic	€3.00-4.00 for 4kg boxes	
Mingolo, Crema de Oro, Banilejo	€2.50-3.50 for 2kg boxes by air	

Type of mango	Free on Board (FOB) in Euros per box	Cost & Freight (CF) in Euros per box
Mangoes from Thailand		€10.00-15.00 for 3kg boxes by air to Amsterdam
Kent from Peru intended for the niche market (air freight, premium packaging)		€40.00-50.00 for a box containing 10-12 premium mangoes

4.3 Quality requirements

For mango producers and exporters, adherence to **international quality standards** is essential to ensure that the produce meets market expectations and regulatory requirements. Although there is no dedicated European marketing standard for mangoes, two mango-specific standards exist: one developed by the United Nations Economic Commission for Europe (**UNECE**) and another by **Codex** (CXS 184-1993). These documents provide valuable guidance for export preparations. In addition, the Organisation for Economic Cooperation and Development (**OECD**) has published a brochure featuring photographs that are based on the UNECE standard. Quality is defined in the UNECE standard as a series of stringent criteria covering minimum requirements, sizing, classification, and packaging.⁵³









4.3.1. General requirements

At the core, every mango must be intact, sound, clean and fresh in appearance. This means the fruit should exhibit **no significant physical damage** such as unhealed cracks, severe sunburn, bruising, or signs of rotting. Additionally, mangoes must be **free of pests and damage, abnormal external moisture, foreign matter, and off-flavours or odours** that could indicate poor storage or handling. These minimum requirements ensure that the product is both safe for consumption and visually appealing to buyers. An overview

⁵³ Organisation for Economic Co-operation and Development. (2020). International standards for fruit and vegetables: Mangoes [Brochure]. OECD Publishing.

of some quality defects which are not allowed is shown in Table 11 below.

Table 11. Illustrations of common mango defects as defined in the OECD Standard. Source: OECD International Standards for Fruit and Vegetables: Mangoes.

Unhealed crack	Severe sunburn affecting the flesh	Stem end rot	
			
Anthracnose	Bacterial black spot	Stem end cavity	
			

In addition to the minimum requirements, the UNECE standard outlines specific **maturity requirements** to ensure mangoes are harvested at an optimal stage of development. These guidelines focus on factors such as firmness, colour, and overall ripeness, ensuring the fruit continues to develop its flavour and shelf life post-harvest. Harvesting the fruits too early will result in inferior flavour and aroma (Table 12).

Table 12. Examples of Mango Maturity defects as defined in the OECD Standard Source: OECD International Standards for Fruit and Vegetables: Mangoes.

Underdeveloped, immature fruit	Fruit not sufficiently mature to continue the ripening process	Over-ripe fruit
		

Mangoes are further classified into three distinct categories: Extra, Class I, and Class II, which reflect the level of quality and presentation.²⁹ For the Extra category, fruits must demonstrate superior quality with virtually no defects aside from very minor superficial imperfections that do not affect the overall appearance or shelf life. Class I mangoes allow slight defects such as minor shape irregularities, small areas of skin discolouration, or minimal bruising, while still maintaining the characteristic traits of the variety. Class II mangoes, although meeting minimum standards for edibility, may exhibit more noticeable shape defects or skin blemishes, provided they do not compromise the fruit's functionality in the market.

For all three classes, tolerances are designed to account for natural variations and slight deteriorations during handling and transport, ensuring that overall market quality is maintained (Table 13).

Table 13. *Overview of Quality Tolerances and Specific Requirements for Mango Classes. Source: OECD International Standards for Fruit and Vegetables: Mangoes.*

Quality Class	Class description	Total Tolerance Allowed	Specific Allowance
Extra	Superior quality; must display the typical shape and characteristic blushing, with only very slight defects.	5% (by number or weight)	No more than 0.5% may be downgraded to Class II
Class I	Good quality; may have slight shape defects, minor skin blemishes from rubbing or sunburn, and slight bruising.	10% (by number or weight)	Up to 1% may fall below Class I quality
Class II	Reasonable quality; may include more noticeable shape defects, larger skin blemishes, and minor decay.	10% (by number or weight)	Up to 2% may be affected by decay

Practical outcome: Ensure exported mangoes meet the UNECE and Codex standards and sort and grade the mangoes already based on the OECD classification of Extra, Class I, Class II.

4.3.2. Size and packaging

Sizing also plays a crucial role in quality control. Fresh mangoes are classified according to Size Codes A, B, C and D (Table).⁵⁴ Size is determined by the weight of the fruit or by the number of fruits per packaging unit, often a 4 kg box. It is important to note that the minimum weight for mangoes in EU supermarkets is 300 grams.

Table 14. *Size codes for mangoes. Source: UNECE standards for mangoes.*

Size code	Weight in grams	Maximum permissible difference between fruit within the package in grams	Typical number of fruits per 4 kg box
A	100-350	75	12-18
B	351-550	100	8-12
C	551-800	125	5-7
D	>800	150	4-5

⁵⁴ United Nations Economic Commission for Europe. (n.d.). International standards for fruit and vegetables: Mangoes [PDF]. Retrieved from https://unece.org/fileadmin/DAM/trade/agr/standard/standard/fresh/FFV-Std/English/45_Mangoes.pdf

In international trade, sizing preferences vary greatly among distribution channels and modes of transport. Supermarkets often sell sea-freighted mangoes and prefer 8 to 9 pieces of fruit per 4 kg box. On the other hand, wholesalers supplying street markets retail often request smaller mangoes (sizes 9-12). Regarding air-freighted mangoes, sizes 9 and 10 are more common, although other sizes can be sold as well. Furthermore, there can be specific market preferences regarding sizes. In

Germany, larger mangoes are most popular, while in Scandinavia, smaller mangoes are mostly sold individually. Spain, on the other hand, is adaptable to various sizes. It is also noteworthy that the mango season usually begins with smaller fruit, and prices tend to adjust as mangoes reach a size classification of 9. One exporter currently exports Mingolo mangoes of size 12, with 5-7 mangoes in 2 kg boxes (Figure 11).



Figure 11. Export cartons of Mingolo mangoes (Dominican Republic), packed in 2 kg boxes. Left: green-mature stage. Right: fully ripened stage. Both photos show a 12-count configuration, corresponding to medium-size mangoes (Size Code B).

Packaging requirements differ depending on customer needs and market segments. Mangoes must be packed in **robust, clean, and appropriate** materials that protect them from physical damage, contamination, and environmental stress. The packaging should reflect the quality class of the mangoes, ensuring that only uniformly high-quality fruits are displayed to the market. **Proper labelling**, including the origin, variety, and class, enables traceability and builds buyer confidence. The standard packaging for mango exports is a **4 kg cardboard box**. Uniformity within each package not only enhances visual appeal

but also facilitates fair pricing and customer satisfaction. For all mangoes, a **10% tolerance** (by number or weight) is allowed for mangoes that do not fully meet the defined size requirements, ensuring that minor deviations in size do not compromise marketability.^{29, 30} Based on discussions with European importers and the recommendation to target niche markets with selected mango varieties, packaging can also play a key role in enhancing the product's exclusivity. A good example is in a case of the Kent mango from Peru, which is **harvested when fully ripe** on the tree and then **transported to Europe by**

airfreight to preserve its flavour and freshness. These mangoes are often presented in **high-end packaging**, such as boxes containing individually wrapped fruits in protective socks (Figure 12). In this example, the mangoes were sold on the consumer market for €40-50 per box, containing 10-12 mangoes. This market is not very big, but it could be an interesting niche market. This combination with ripeness, rapid transport, and premium presentation allows the mango to be positioned as an **exclusive product**, appreciated for both its superior taste and attractive packaging.



Figure 12. Premium packaging of boxes containing individually wrapped fruits in protective socks.

Practical outcome: Retail demands a minimum weight of 300 grams per piece, making only the Mingolo suitable for this sales channel. Position the selected mango varieties as premium products by maximizing tree ripening, using high-quality and distinctive packaging, and opting for airfreight transport.

4.3.3. Quality Standards

Beyond mandatory pesticide, microbiological, and phytosanitary regulations, mango exporters must also adhere to **additional quality standards** set by the EU and individual retailers. To demonstrate compliance with **good agricultural** and **food safety practices**, mango producers and exporters should obtain **GLOBALG.A.P.** certification for primary production and BRCGS, IFS, FSSC 22000, or other HACCP-based food safety management certifications for processing facilities. Management systems recognised by the Global Food Safety Initiative (GFSI) are highly recommended for market acceptance.³¹ The EU places increasing **emphasis on social and environmental responsibility**

in agricultural supply chains, including mango production. Mango cultivation often involves smallholder farmers, making it crucial for exporters and mango collectors to demonstrate commitment to ethical and environmental standards. Buyers increasingly demand compliance with Sedex Members Ethical Trade Audit (**SMETA**) and GLOBALG.A.P. for sustainability and responsible sourcing.³¹ New environmental and social initiatives are emerging, with stricter audit requirements. For instance, the Sustainable Trade Initiative for Fruit and Vegetables (SIFAV), a European industry coalition, has set ambitious targets for 2025, including fair living wages and carbon footprint reduction. Additionally, major retail chains sometimes impose **additional standards**. For example, Tesco Nurture, an

add-on to GLOBALG.A.P., ensures stricter production and sustainability requirements. Discussions with importers revealed that their **minimum requirement is GLOBALG.A.P.**, often **combined with compliance with SMETA**. These certifications are crucial to reach retailers in Europe, but the niche market is also increasingly focusing on food safety and thus compliance with food safety and quality standards.

Practical outcome: Mango growers should be certified for GLOBALG.A.P. as a minimum requirement to gain access to the European market.

Practical outcome: Food safety is an important topic in Europe, and packhouses are therefore required to have food safety and quality management systems in place.

Organic mangoes represent a niche but growing market. Certified organic mangoes are primarily traded by specialised importers, such as ProNatura (France), Biotropic (Germany), Eosta, and OTC Organics (Netherlands). To supply organic mangoes in Europe, producers must comply with organic farming practices as outlined in Regulation (EU) 2018/848 and obtain certification from an accredited certifying body. This regulation imposes strict controls on organic imports, including the requirement for detailed traceability documentation throughout the supply chain. Exporters collaborate closely with their European partners to ensure full compliance and maintain comprehensive records to meet regulatory inspection requirements. In terms of market potential, the organic mango market is largely dominated by European supermarket chains, and they are not able/willing to pay premium prices for organic mangoes. Therefore, the **potential is estimated to be low**.

4.4 Sanitary and Phytosanitary Requirements

4.4.1. Pesticide Residues and Contaminants

Mangoes are susceptible to **various diseases** caused by fungi (e.g., anthracnose, mildew) and bacteria (e.g., bacteriosis), necessitating the use of **chemical treatments**. The EU regulates pesticide residues through Regulation (EC) No 396/2005, which sets **Maximum Residue Levels** (MRLs) for authorised pesticides. Exporters must ensure compliance with these limits to prevent market rejection. The **EU Pesticide Database** provides an updated list of allowed pesticides and their respective MRLs for [mangoes](#).

Since the main challenge for mangoes from the Dominican Republic entering the EU market has been the exceedance of MRLs, **addressing this issue is crucial** to maintain market access and protect the market's reputation.

Certain EU Member States, such as Germany, the Netherlands, and Austria, impose stricter MRLs than those established by the EU. To reduce pesticide dependency, growers should implement **Integrated Pest Management** (IPM) strategies, which combine preventive agricultural practices with controlled chemical use. Additionally, **heavy metal contamination** must be monitored: lead levels should not exceed 0.10 mg/kg, and cadmium should remain below 0.020 mg/kg, according to Regulation (EC) No 2023/915.

Practical outcome: MRLs in Europe are strict, and most importers require extensive registration of Plant Protection Products (PPP) by growers. Adherence to MRLs is crucial to maintain market access and protect the market's reputation.

4.4.2. Phytosanitary Regulations for Fruit Flies

Fruit flies (Tephritidae) pose a major challenge for mango exporters, as their presence can lead to import bans. The EU Plant Health Regulation (EU) 2019/2072 mandates that all mango shipments must be accompanied by a **phytosanitary certificate** verifying compliance with pest control requirements. **Hydrothermal treatment** (hot water treatment) is widely used to eliminate fruit flies, although such a treatment is not (yet) mandatory for mango exports to the EU.

Under Directive (EU) 2019/523, phytosanitary certificates from non-European products must include one of the following statements from the national plant protection organisation (NPPO) in the exporting country:

- Mangoes originate from a country or region recognised as Tephritidae-free.
- No signs of Tephritidae have been detected in the production area throughout the entire growing cycle, verified by monthly inspections. This includes official inspections at least monthly during the 3 months before harvesting and on the harvested fruit. Information on traceability must be indicated on the certificates
- The mangoes have undergone an effective treatment to ensure they are pest-free, with treatment details specified on the certificate.

Failure to meet these phytosanitary standards can result in **shipment rejection** or destruction upon arrival in the EU. Exporters should coordinate closely with local plant health authorities and follow recommended pest control measures, such as regular trapping exercises during high-risk seasons, to ensure compliance.

Practical outcome: Mango shipments must be accompanied by a phytosanitary certificate adhering to the guidelines.

5. SWOT

For the selected mangoes from the Dominican Republic, several Strengths, Weaknesses, Opportunities, and Threats have been identified, in relation to their market potential on European markets (Figure 13).

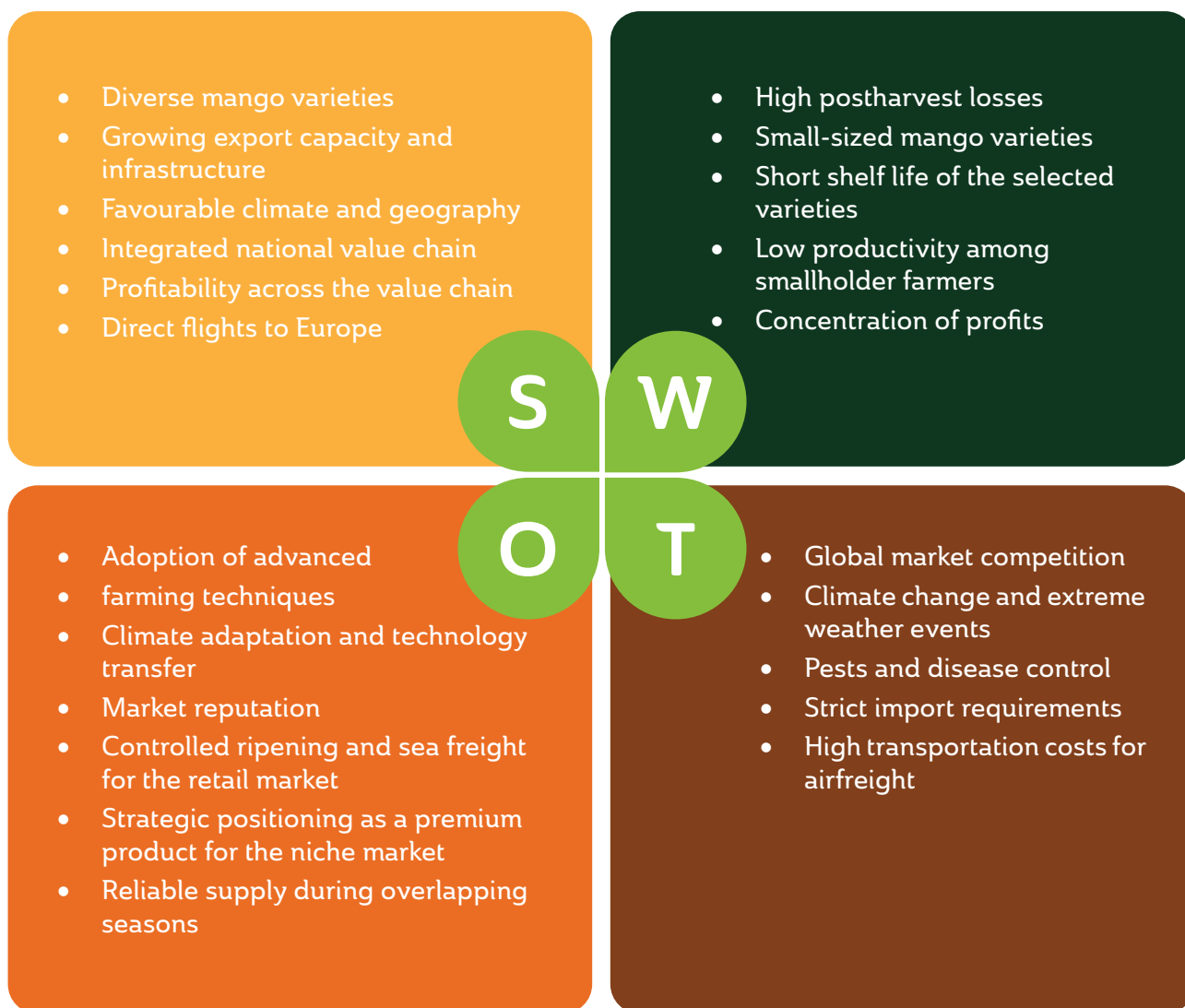


Figure 13. SWOT analysis for the selected mango varieties from the Dominican Republic, in relation to their market potential on European markets.

5.1 Strengths

- **Diverse mango varieties.** The Dominican Republic cultivates over 300 mango varieties, with Mingolo, Crema de Oro, and Banilejo accounting for 40% of exports and seeing increased demand.
- **Growing export capacity and infrastructure.** The country has developed 22 packing

facilities (six with hydrothermal treatment) and 1,900 registered producers, with 1,333 certified for export, indicating a robust and expanding export infrastructure.

- **Favourable climate and geography.** The country benefits from a favourable climate and geography with ideal conditions and fertile soils for mango cultivation, particularly in the coastal zones of the

Southwest and Midwest. Its geographical location also provides access to maritime and air transport facilities.

- **Integrated national value chain.** The mango sector is highly integrated into the national economy, with 92% of the value of production benefiting national actors in 2020, as only a few goods and services need to be imported.
- **Profitability across the value chain.** The activities across the mango value chain are generally profitable, with operating profits exceeding the farm worker minimum wage for all actors, including micro and small producers.
- **Direct flights to Europe.** The existence of direct flights to Europe highlights a logistical advantage supporting the air freight possibilities to reach niche markets.

5.2 Weaknesses

- **High postharvest losses.** Postharvest losses reach up to 50% depending on the mango variety, postharvest handling, and technologies used. A significant portion of mangoes is also not harvested due to a lack of market and processing facilities.
- **Small mango varieties.** Some Dominican mango varieties are relatively small, such as the Banilejo, which typically weighs between 150 and 250 grams, limiting its potential in mainstream EU retail, where a minimum weight of 300 grams is required.
- **Short shelf life of the selected varieties.** Related to the small size of the selected mangoes is a relatively short shelf life. This limits logistical options and challenges market options in distant markets like Europe.
- **Low productivity among smallholder farmers.** Small producers face challenges reaching export markets due to low productivity per hectare, high certification costs, limited access to technology, and production bottlenecks.
- **Concentration of profits.** There is a concentration of profits within the value chain, with large companies and

intermediaries holding a significant share of the operational profit, while producers have a relatively low share.

5.3 Opportunities

- **Adoption of advanced farming and postharvest techniques.** Techniques like flower induction can shift harvest periods to less competitive market windows, allowing producers to command higher prices and reduce competition with other major exporters. Additionally, training on best handling practices and improvement of the cold chain and storage facilities can further strengthen the Dominican mango value chain. Other postharvest technologies, such as natural coatings, can offer a cost-effective solution to extend shelf life and maintain appearance.
- **Climate adaptation and technology transfer.** Implementing improved irrigation and adaptive farming practices can mitigate climate risks and boost productivity, especially of importance for smallholder farmers.
- **Market reputation.** There is an opportunity to enhance the market reputation of Dominican mangoes by consistently delivering high-quality products free of pests and diseases. Storytelling, highlighting the unique characteristics of the mangoes and sharing this with importers, along with providing samples, can also build market interest.
- **Controlled ripening and sea freight.** Exploring and implementing controlled ripening protocols can enhance shelf life, improve quality consistency, and potentially enable sea freight, which is currently limited due to the perishability of some varieties. There is potential to optimise container space by including Dominican mangos in existing sea freight shipments. This can contribute to lower transport costs per unit and improve the overall competitiveness of the product in the more cost-sensitive markets of Europe, such as its retail market. Please be aware

that the sweet taste and soft texture of the mango can be affected by artificial ripening and needs to be explored thoroughly.

- **Strategic positions as a premium product for the niche market.** There is a strong potential to expand into niche markets by positioning the mangoes as a premium product. This can be achieved by maximising ripeness at harvest, utilising high-quality and distinctive packaging, and considering air freight to maintain freshness.
- **Reliable supply during overlapping seasons.** The Dominican Republic can capitalise on the inconsistent supply from other producers with overlapping seasons (such as Ivory Coast, Senegal, and Mali) by offering a more reliable and stable supply due to robust logistics and consistent protocols.
- **Secure fast and reliable supply chains.** Optimise supply chain reliability and responsiveness by coordinating logistics with all relevant parties in advance, ensuring timely pickup and minimising quality loss due to short shelf life.

5.4 Threats

- **Global market competition.** The Dominican Republic faces significant competition from well-established mango production countries such as Mexico, Brazil, and Peru, which have strong production and export infrastructure. Mexico, in particular, is a strong competitor in the USA market with coinciding harvest seasons. Brazil and Peru are key competitors in the Netherlands and the UK, the Dominican Republic's largest export markets.
- **Climate change and extreme weather events.** Mango production is vulnerable to climate change, as evidenced by the challenging 2023 season impacted by El Niño and extreme weather events, affecting crop consistency and quality. Climate change is expected to further negatively impact agricultural productivity.
- **Pest and disease control.** Affected by

climate change and rainfall excess, there are more ongoing pest and disease control issues, including fruit flies, Anthracnose, and the mango malformation disease. These issues compromise tree health and fruit quality.

- **Strict import requirements** related to food safety and quality, including the need for certifications like GLOBALG.A.P. and compliance with stringent MRLs in Europe, pose market access barriers. These requirements can be particularly challenging for smallholder farmers due to certification costs. Phytosanitary regulations mandating fruit fly-free shipments are also critical.
- **High transportation costs for airfreight.** High airfreight costs increase expenses and create reliance on air transport. Due to the vulnerability and short shelf life of these mangoes, airfreight is often necessary to access niche markets. However, this significantly raises freight costs, positioning these varieties as higher-priced, niche products. Additionally, many retailers have sustainability targets that discourage airfreighted products, limiting the suitability of these mangoes for mainstream retail channels.

6. MAIN POTENTIAL

The Dominican Republic has identified the Mingolo, Crema de Oro, and Banilejo mango varieties as having strong potential to expand their presence in European markets, building upon their existing success in niche markets like the USA. While they are relatively unknown to most European importers included in the study, the European market is generally receptive to new mango types that offer an attractive appearance and appeal to consumer taste preferences.

6.1 Potential market segments

Based on discussions with European importers and market analysis, several key segments hold promise for the Mingolo, Crema de Oro, and Banilejo varieties:

- **Niche markets in southern Europe:** Countries in Southern Europe, such as Italy and Spain, present an opportunity within niche markets, including speciality and ethnic stores. Consumers in these regions are often more willing to pay premium prices for high-quality fruits and exhibit a greater tolerance for fibrous mango varieties. While these markets generally prefer larger mangoes, they could potentially adapt to the relatively smaller sizes of the Dominican varieties. Hence, this creates a market opportunity for all three niche varieties.
- **Retail and niche markets in Scandinavian and northern European countries:** These markets show an openness to smaller-sized mangoes, particularly if the price point remains reasonable, as pricing is often per piece rather than per weight. Scandinavian consumers also have a strong preference for sweeter mango varieties, which aligns well with the flavour profiles of the Mingolo and Banilejo varieties. Notably, the Mingolo variety, with its sweeter flavour and an average weight that generally exceeds the EU supermarket minimum of 300 grams, offers the greatest potential in these

markets. Though it should be noted that not all consumers in these markets are open to fibrous mangoes. The Banilejo, typically weighing between 150 and 250 grams, will face limitations in mainstream retail channels due to the EU's minimum weight requirement. Therefore, the niche market in these countries could provide opportunities for the Banilejo, targeting ethnic supermarkets and speciality stores.

- **Niche markets in the United Kingdom:** The UK market presents a strong potential for the selected varieties, particularly within ethnic supermarkets and speciality stores serving the Indian community. This consumer segment shows strong demand for fibre-rich mangoes (such as the Mignolo) and is already familiar with a wide range of exotic varieties, making them more open to trying non-mainstream selections like Crema de Oro and Banilejo. Seasonal peaks in demand, linked to cultural festivities such as Diwali and Eid, further strengthen the market potential for premium, air-freighted mangoes. Although the mainstream retail sector tends to prioritise larger fruit, the ethnic and speciality store segment provides a stable outlet for smaller mango varieties with intense flavour and traditional appeal.
- **Existing niche channels in France:** There is already evidence of success in supplying Mingolo mangoes to speciality shops and ethnic stores in France, indicating a pre-existing market for these unique varieties.

6.2 Actions required to access markets

To effectively tap into the potential of these European markets, several key actions need to be undertaken:

- **Building market awareness through storytelling:** Given the current low familiarity with the Mingolo, Crema de Oro, and Banilejo varieties in Europe, strategic storytelling is crucial. Exporters and

producers need to clearly communicate the unique characteristics of each variety and what distinguishes them from others. This can involve creating informative presentations detailing the mangoes' origin, the farms where they are grown, the growers themselves, their history, and specific characteristics. Sharing such narratives with importers will enable them to effectively market these varieties to their retail clients. Furthermore, storytelling is also a useful strategy to differentiate from other niche varieties from other mango exporting countries, as it highlights the uniqueness of the Dominican Republic varieties.

- **Providing Samples for Evaluation:** When importers express interest, providing samples of the selected mango varieties is highly recommended to allow them to evaluate the product and assess its market potential firsthand. Participate in European trade fairs and organise consumer sampling events to build awareness and loyalty. Direct engagement allows buyers and consumers to experience the distinctive taste and quality of Mingolo, Crema de Oro, and Banilejo mangoes.
- **Meeting Stringent Quality and Food Safety Standards:** Accessing European markets necessitates strict adherence to international quality standards and regulatory requirements. This includes:
 - Obtaining GLOBALG.A.P. certification as a minimum requirement for primary production, often combined with compliance with SMETA for social and ethical standards.
 - Ensuring that packhouses have food safety and quality management systems in place.
 - Strict adherence to Maximum Residue Levels (MRLs) for pesticides, which are rigorously enforced in the EU. Many importers require extensive registration of Plant Protection Products (PPP) by growers.
 - Ensuring all mango shipments are accompanied by a phytosanitary certificate verifying compliance with fruit fly control requirements, as mandated by EU Plant Health Regulation (EU) 2019/207219.
- Meeting the quality standards outlined by UNECE and Codex, and EU regulations, including proper sorting and grading based on the UNECE/Codex classification (Extra, Class I, Class II).
- **Addressing shelf life considerations:** The selected mango varieties are currently air-freighted due to their vulnerability and short shelf life, leading to higher costs and positioning them as niche products. Extensive shelf life testing is recommended to evaluate their compatibility compared to more conventional varieties like Kent and Keitt. Exploring and implementing controlled ripening protocols could potentially enhance shelf life, increase quality, and even enable sea freight, which would significantly reduce transportation costs and is attractive for cost-sensitive markets, such as the retail market. Furthermore, to limit quality decay during transport due to delays, it is needed to have a tight, efficient and reliable supply chain with all stakeholders given the narrow quality window of the mangoes.
- **Strategic positioning and packaging:** To cater to niche markets, especially those willing to pay a premium, positioning the selected mango varieties as premium products is advisable. This can involve maximising ripening on the tree, using high-quality and distinctive packaging, and continuing with airfreight to ensure freshness upon arrival.
- **Maintaining Reliable Supply Chains:** European importers value consistent and reliable supply. Dominican producers benefit from more robust logistics and consistently implemented fruit fly protocols compared to some other suppliers, like Senegal. Maintaining and strengthening these logistical advantages will be crucial for building trust and long-term relationships with European buyers.

6.3 Potential for the varieties

The main potential for the Mingolo, Crema de Oro, and Banilejo mango varieties in European markets lies in their ability to **carve out strong positions within niche market segments** that appreciate their unique characteristics.

Mingolo. This variety appears to hold the broadest potential overall in Europe, particularly within retail in general or in niche markets in Scandinavian and Northern European countries. This is attributed to its sweet flavour and a size that generally meets the EU supermarket minimum weight requirement of 300 grams, as its weight ranges from 275-550 g. Given the focus on price per piece in these regions and the consumer preference for sweeter mangoes, Mingolo could succeed in these markets. Furthermore, the Mingolo has the potential to succeed in the UK niche market, targeting ethnic supermarkets and speciality stores, serving the Indian community. This community generally has a stronger preference for fibre-rich mangoes, thus fitting the characteristics of the Mingolo. On top of that, the Mingolo could also have the potential to succeed in niche markets in Southern European countries, due to their willingness to pay premium prices for high-quality fruits.

Crema de Oro. The sweet and tropical notes of the Crema de Oro make it suitable for targeting niche retail in Southern European markets such as Italy and Spain. Consumers in these countries are often more willing to pay premium prices for high-quality fruits. While they generally prefer larger mangoes, they could potentially be adaptable to the smaller-sized (250-350 g) Crema de Oro. Additionally, Crema de Oro shows potential in the UK, particularly within ethnic supermarkets serving the Indian community, where there is strong familiarity with exotic mango varieties.

Banilejo. While the smaller size (150-250 g) of the Banilejo presents limitations for

penetration into mainstream supermarket channels in the EU, which typically require a minimum weight of 300 grams, it can still achieve success within niche channels in the UK, Southern and Northern European markets. In the UK, Banilejo may find a stable outlet through ethnic and speciality stores, as the Indian community is familiar with exotic mangoes. In Northern European countries, the market is more open to smaller-sized and sweet mangoes, particularly if the price point remains reasonable. For the Southern European markets, consumers are more willing to pay a premium price for high-quality fruits.

To fully realise this potential, a concerted effort focusing on strategic market entry, building brand awareness through compelling narratives, ensuring consistent high quality and adherence to stringent standards, and optimising supply chain logistics will be essential. By effectively addressing these areas, the Dominican Republic can significantly enhance the presence and value of its unique mango varieties in the diverse European marketplace.



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