

# Investment Profile for Avocado

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**AGRO-INVEST**

**AGRO-INVESTMENT CORPORATION**

Promoting and Facilitating Agri-Business Investments



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## Executive Summary

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Farm Size:	20 acres (8 hectares)
Project Description:	<p>The project is seeking to establish a 20-acre avocado farm.</p> <p>The average annual net profits over a 7-year period is projected to be approximately J\$127M</p> <p>The accumulated 7 year net profit is projected to be approximately J\$891.9M.</p> <p>Capital Investment Cost: J\$8.5M</p>
Project Sector:	Agriculture: Crop Production of Avocado
Financial and Economic Analysis	<p>Internal Rate of Return: 115% (at normal investment assumptions over a period of 7 years).</p> <p>Net Present Value: J\$502.9M (at normal investment assumptions over a 7-year period).</p>
Recommendation:	Based on the outcomes of the analysis, the project is viable.

Table 1: Product Profile – Avocado



**Choquette Avocado**



**Haas Avocado**



**Gwen Avocado**

**Botanical Name and Origin:** The botanical name of avocado is *Persea americana*. It has its origins in south-central Mexico and was introduced to Jamaica in the mid-17<sup>th</sup> century.

**Fruit Description:** The avocado is a large berry fruit containing a single seed. It is rich in antioxidants, fiber, and unsaturated fats.

**Species:** There are 3 main species of avocados, they are Mexican, West Indian and Guatemalan. These species have over 500 varieties of avocados which vary in fruit size, texture, shape, and maturity rate. The 3 main species are the Choquette, Gwen and Haas.

#### 1. Choquette

The Choquette variety comes from South Florida and is produced by crossing the Guatemalan with West Indian species. It is a very large fruit with silky, watery flesh and has a mild taste.

#### 2. Hass

It is perhaps the most common type of avocado which makes up for 80 percent of the produced avocados in the world. This medium-sized avocado type features a pale green flesh with an intense flavor that is suitable for preparing guacamole.

#### 3. Gwen

The Gwen was developed in California and produced from the Guatemalan species. It has a taste similar to the Hass avocado. It is characterized by a golden-green, creamy flesh, having a nutty flavor.

**Medicinal Uses:** Avocado fruit is used to lower cholesterol levels as well as to increase sexual desires, and to stimulate menstrual flow. Some of the oils in avocado (chemists call these oils the *unsaponifiable fractions*) are used to treat osteoarthritis. The seeds, leaves and bark are used for dysentery and diarrhea.

**Value Added Products:** the following value added for avocado:

- Avocado powder;
- Avocado juice;
- Avocado sauce;
- Avocado paste;
- Avocado frozen halves;
- Avocado oil;
- Dried and shredded; and
- Avocado ice cream.

## **Agronomics**

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The agronomy of avocado takes into consideration the whole range of influences on its production. This is to include climate and adaptation; soil; water and water availability; the genetics of the avocado; the properties of the soil and how the soil interacts with it; what nutrients it needs; the ways that the avocado grows and develops; and how best to control weeds, insects, fungi, and other pests.

### **Agro-climatic suitability**

Avocados do well in the mild-winter areas of California, Florida and Hawaii, but thrive in Mexico and Jamaica all year. Avocados do best some distance from ocean influence but are not adapted to the desert interior. West Indian varieties thrive in humid, tropical climates and freeze at or near 0° C. Guatemalan types are native to cool, high-altitude tropics and are hardy -1.1 to 4.5° C. Mexican types are native to dry subtropical plateaus and thrive in a Mediterranean climate. They are hardy -4.5 to -7.2° C. Avocados need some protection from high winds which may break the branches.

### **Soil suitability**

Avocado trees like loose, decomposed granite or sandy loam best. They will not survive in locations with poor drainage. The trees grow well on hillsides and should never be planted in stream beds. They are tolerant of acid or alkaline soil. In containers, use a planting mix combined with topsoil. Plastic containers should be avoided. It is also useful to plant the tub with annual flowers to reduce excess soil moisture and temperature. Container plants should be leached often to reduce salts.

### **Planting and planting materials**

Desired clonal rootstocks can be propagated by a method known as the etiolation technique. The largest seed are planted in gallon cans and the seedlings are then grafted to a root rot tolerant clonal scion. When the stem of the graft reaches about 1/4 inch in diameter, the top is cut off leaving a whorl of buds just above the graft. A 4-inch band of black tar paper is formed into an extension of the can and filled with vermiculite and placed in a dark box with high temperature and humidity. When growth is some 3 – 4 inches above the vermiculite, the plant is removed into the light where the upper portion quickly assumes a green colour. The tar paper collar is subsequently removed; the shoot is severed from the seed and then placed in flats where the cuttings are rooted in the conventional manner. Any seed may also be used for rootstock, but Mexican types make the strongest growth and are the most often used.

Plant cleaned seeds as soon as they are ripe. The seedling plants will be ready to bud the following year. Budding is done when suitable buds are available. Larger stocks are worked by bark grafts in the spring. Scions are collected after the buds are well-formed. Paint and cover the graft with a moistened plastic bag and place a vented paper bag over the whole.

## **Planting outlay**

The avocado trees are planted at 20' X 15' spacings, with 145 trees per acre. The orchard will have to be thinned due to crowding in the orchard as the trees grow. This occurs after 8 to 12 years. 72 trees per acre will be removed from the orchard over a 10-year period. The life of the orchard is estimated to be 40 years.

## **Site selection**

The selection of a suitable site is of the utmost importance. Avocados are extremely susceptible to the root rot fungus *Phytophthora cinnamomi*. No avocado rootstock is completely resistant to this disease. Surface and subsoil drainage must be excellent. Sloping ground with a porous top soil structure may be unsuitable if clay bands or hard pans prevent the free flow of water through the soil. Checking the profile with soil pits to a depth of about 2 m is a pre-requisite. Natural vegetation can indicate localized soakage and high water tables. Steep gradients, particularly where trees are planted in banana plantations make harvesting and other management operations difficult. Such areas are susceptible to erosion. The preferred aspect is a **slope facing north to east**. Plantings on these slopes with rows running north-south maximizes sunlight inception.

## **Preparation for planting**

Avocados are grown on a wide range of soil types from free-draining, red basaltic loams, previously supporting rain forest, to eroded coastal sand dunes. Where soil depth is marginal (less than one meter), mounding along the row is employed to increase the effective root zone and improve drainage. Prior to planting a new orchard, it is recommended that any tree stumps or large roots be removed to reduce the risk of root rot developing and spreading to young trees. The pH of the soil should be checked and adjusted to about 5.5 with lime or dolomite if necessary. Liming materials should be applied before the final cultivation to ensure that they are well incorporated into the soil. Deep ripping is recommended to improve sub-surface drainage. Zinc is the most common trace element deficient and if required, is also incorporated during final soil preparation.

Individual tree sites are prepared by hand about 3 months prior to planting. At each planting site, 200 to 300 g of superphosphate along with 10 to 15 l of poultry manure are dug into a depth of 300 mm over a one square meter area. The 'Pegg philosophy' – cover-cropping and mulching as an integral part of root rot control – is practised by a significant proportion of growers in subtropical areas during the establishment phases of the orchard. Invariably these properties have higher productivity.

The cost of establishing an avocado orchard can be high, and this investment can be jeopardized if sound planning and management strategies are not adopted. The first activity is to take a soil sample for chemical analysis and then apply the nutrients that are recommended. It may take longer than one year to correct a soil nutrient imbalance. Control of phytophthora root rot is essential. Two main principles apply:

- Excellent surface drainage - This is particularly important in high rainfall areas where, after heavy rain, water will pond in slight depressions and threaten nearby trees. On gently sloping land, trees are planted in rows running up and down the slope. It is desirable to form mounds for each tree row, so that water quickly drains away from trees and then flows down the interrow space. This also gives a deeper layer of topsoil for the tree roots.

- High levels of organic matter - Mounding, although it is an expensive operation, can mean the difference between tree survival and tree death.

### **Root rot prevention**

A program of green manuring may be desirable before planting. After planting, aim at maintaining these high levels of organic matter, so that the soil condition resembles that of natural rainforests. Under these conditions, Phytophthora root rot caused by *Phytophthora cinnamomi* (a major international disease of avocado and is present in all countries producing this crop) is suppressed biologically. It is successfully controlled by trunk injection with potassium orthophosphonate using a 20% a.i. solution which is injected at the rate of 15 ml per m of tree diameter. Despite the spectacular success of phosphonate treatments, an integrated approach of biological and chemical control is still recommended in the high-risk subtropical areas. Anthracnose, a serious fruit problem in most environments, is controlled by regular spraying with copper-oxchloride and a post-harvest treatment of prochloraz (Sportak). Verticillium wilt is a soil-borne disease which attacks the vascular system but seldom kills plants, and there is no effective fungicidal treatment. Therefore, it is a disease of lesser significance. Green manure cropping is important during the establishment phase. It prevents erosion, increases soil organic matter and facilitates settling. In later years, the area can be sown to permanent sod.

### **Roadways**

The provision of roadways and surface drains should be considered. Run-off from land above the plantation should be diverted into grassed waterways which prevent excess water from entering the plantation.

### **Irrigation requirement**

Over irrigation can induce root rot which is the most common cause of avocado failure. To test to see if irrigation is necessary, dig a hole 9 inches deep and test the soil by squeezing. If it is moist (holds together), do not irrigate; if it crumbles in the hand, it may be watered. Watch soil moisture carefully at the end of the irrigating season. Never enter winter with wet soil. Avocados tolerate some salts, though they will show leaf tip burn and stunting of leaves. Deep irrigation will leach salt accumulation.

Avocado trees may not need irrigation during the winter rainy season, but critical for prolonged mid-winter dry spells. Avocados are very sensitive to moisture stress, especially during flowering, fruit set and fruit development. The avocado is a tree of rain forest origin and requires regular watering to maintain high yields. Water monitoring is by either tensiometers or the more sophisticated electronic monitoring devices that provide a continuous picture of the water status of the root zone. When using tensiometers, it is usual to maintain soil metric potential between -40 and -10 kPa at 300 mm depth.

Most orchards have undertree mini-sprinklers to supplement rainfall and to apply nutrients to the trees (fertigation). Water use during the winter months is reduced but there is a rapid increase in requirement as the trees come into flower during early spring. Water stress during the first eight weeks of fruit growth can lead to reduced fruit size as cell division is retarded. Also, water stress during the natural period of fruit drop at the end of spring, can increase fruit loss, thereby reducing final yield. Ring-neck, a natural cincturing of the pedicle, has been related to water stress during the later stages of fruit maturity, and can reduce fruit size and final yield. Therefore, during these critical periods the soil profile should not be allowed to dry out and tree requirements should be monitored, for example, using tensiometers.

## **Fertilization**

The application dose and proportion of manures and fertilizers are generally based on the soil fertility, tree age, growth and yield. Commence feeding of young trees after one year of growth, using a balanced fertilizer, four times yearly. Older trees benefit from feeding with nitrogenous fertilizer applied in late winter and early summer. Various micronutrients (Fe, Zn, B) have profound influences on tree growth, nutrient uptake and yield of avocado. Integrated nutrient management with inorganic fertilizer, supplemented by organic manuring, is advocated for avocado. In Sikkim (India), the soil is deficient in nitrogen, zinc and boron. Therefore, application of urea is carried out in two split doses, in March/April and September/October (just before and after the onset of the monsoon) is recommended. Foliar application of zinc sulphate (0.5 per cent) may be undertaken in April-May, and other fertilizers applied in soil during March-April.

Yellowed leaves (chlorosis) indicate iron deficiency. This can usually be corrected by a chelated foliar spray of trace elements containing iron. Mature trees often also show a zinc deficiency. Under the existing orchard soil conditions in the Philippines, young and non-bearing avocado trees require only nitrogenous fertilizer. Farmers apply 100-200 grams of  $(\text{NH}_4)_2\text{SO}_4$  or about 50-100 grams  $\text{CO}(\text{NH}_2)_4$ /tree, twice a year. As the trees bear fruit, 500 grams of complete fertilizer are applied, twice a year. For full-bearing trees, two kilograms of complete fertilizer are applied per year. A supplemental application of organic fertilizers, e.g. animal and poultry manure, and compost, is also given. The fertilizer is applied at the onset and towards the end of the rainy season. It is usually applied in a ring around the trunk of the tree or in shallow holes dug beneath the tree canopy.

## **Training and Pruning**

There is little tree training practised on avocados during their establishment years apart from tipping the central shoot to encourage branching. Tipping growing points of trees in their second year to increase tree complexity is carried out by some growers but there is little evidence of benefits. Columnar cultivars require pinching at early age to form a rounded tree. Others need no training. Controlling tree growth in mature orchards remains the biggest challenge of orchard management. Being terminal flowering trees, avocados need to grow each year in order to remain productive, hence trees become larger. To maintain orchard access between rows, major limbs are periodically removed, cutting back to the main trunk. Similarly, to contain tree height major limbs are lopped from the top of the tree when necessary. In some orchards, trees are not pruned at all until their size is so big that they are uneconomic to manage. They are then stumped to approximately one meter high and allowed to re-grow. After this treatment they are back in full production within two years. The best results are obtained by fencing the tree with plastic mesh for the first two to three years. The skirts of avocado trees are sometimes trimmed to discourage rodents, otherwise the trees are usually never pruned. Branches exposed to sun by defoliation are extraordinarily susceptible to sunburn; such branches should always be whitewashed. Most cultivars are ill-adapted to espalier because they are too vigorous.

## **Pests**

*Thrips* *Liothrips persea* Watson, *Scirtothrips aceri* Moulton, *Frankiniella cephalica*, *Heliethrips haemorrhoidalis* (Insecta:Thysanoptera: Thripidae) - Similar to the red mite complex, the thrip pests are constituted by several species in every region. They are found in Florida, California, Mexico, Central and South America, Argentina and Chile. Thrips have a stronger presence in tropical and subtropical coastal zones, and their damage is reduced in the avocado cultivars located between 1900 and 2400 m of altitude.



Thrips are small insects that survive on foliage, by scraping and sucking the superficial cells, thereby causing the appearance of discoloured spots, which are silver-white at first, and later turn dark. This is observed more often on leaves and fruits. However, they can also be found on tender shoots, buds, and flowers. The damages produced by this pest can make the crop lose up to 50% of its commercial value. The major damage is caused when the thrips feed on young fruits, producing crest-shaped malformations of the exocarp.

Small seed weevil, *Conotrachelus perseae* Barber (Coleoptera: Curculionidae: Cryptorhynchinae) - It is found in the eastern central region of Mexico and northern parts of Central America, Guatemala, and Panama. The larvae are of yellowish white colour with a dark cephalic capsule, and reach a length of 6 mm. They tunnel, forming a gallery throughout the pulp until they arrive at the seed, which is usually destroyed. Highly infected areas can affect up to 85% of the fruit, destroy the seeds and notably affect the production since this situation induces the falling of the fruit from buds to maturity.

Large seed weevil, *Heilipus lauri* Boheman (Coleoptera: Curculionidae: Hylobiinae) - The adults are large beaked weevils, 12 to 15 mm in length, of bright reddish-black colour with a rough dorsal section, and elytra with 2 yellow stripes. The larvae are curved in shape, legless and of a creamy white colour. They tunnel through the flesh of the fruit, forming a gallery that extends to the seed, which is usually destroyed. Furthermore, they produce secondary rotting of the flesh and the seed. This pest affects up to 80% of the production as they destroy the flesh, seeds, and cause a premature falling of the fruits.

Seed moth, *Stenoma catenifer* Walsingham (Lepidoptera: Stenomidae) - Seed moths can penetrate fruits of any size and destroy the seed completely. The galleries they form inside the branches cause withering, reduce flowering of the tree and seriously damage up to 90% of the production.

Red or brown mites, *Oligonychus* (Homonychus): *Opunicae hirst*, *O. yothersi* Mc. Gregor, *O. platani* Mc. Gregor, and *Eotetranychus sexmaculatus* Riley. Acarina - The insect complex designed as red or brown mite is present in most of the avocado producing countries, different kinds prevailing in accordance to environmental and climatic conditions. For example, *O. punicae* is the most widely distributed, being found in California, Florida, Brazil, Argentina, Colombia, Ecuador, Chile and Central America. *O. platani* is found in the states of California, Arizona, and Texas, as well as in Coahuila (in the north of Mexico). *E. sexmaculatus* is found in California, Florida and Arizona.

*O. punicae* - attacks the surface of leaves, mainly near the nervation where dusty-like colonies are formed. These mites attack the surface of leaves, produce abundant colonies and hibernate as eggs. The attacks to the trees are more severe during the dry season, with a relative humidity lower than 60%. Rain severely affects these mites, violently decreasing their population at the beginning of the rainy season. When sucking the sap out from the cells, the mites alter the proportions of chlorophyll and photosyntates, which produces the chlorosis symptom: brown coloration of leaves and defoliation. Furthermore, the carbon-nitrogen ratio is altered which reduces the production of growth elements. This results in the reduction of budding, flowering, foliage development, and consequently, the fruit production for the next season.

Rats and squirrels - will strip the fruit. Protect with tin trunk wraps. Leaf-rolling caterpillars (*Tortrix* and *Amorbia*) may destroy branch terminals. Avocado Brown Mite can be controlled by powdered sulfur. Six-spotted Mite is very harmful; even a small population can cause massive leaf shedding. A miticide may be required if natural predators are absent. Snails can be a problem in areas.

## Harvest and Yield

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The annual yields are measured in kilograms as shown in table below. These yields are from the third year of orchard establishment to maturity.

Table 2: yield per acre

Year	Yield (kg per acre)	Total kg yield from 20 acres avocado orchard
3	329	6580
4	658	13160
5	1315	26300
6	2631	52620
7+	4536	90720

## SWOT Analysis for the Establishment of a 20 Acres Avocado Orchard

The table below summarizes the main internal and external factors that might positively and negatively affect the producers and exporters that are interested in trading avocado in Jamaica.

Table 3: SWOT Analysis of avocado

<b>Strengths</b>	<b>Weakness</b>
<ul style="list-style-type: none"> <li>• The product brings great health benefits. It has high nutritional density, is a source of protein, fiber, major antioxidants, stroke prevention, and is used as a baby food. The hass avocado contains about twice of our daily needs for vitamins C, E, and beta-carotene as its calorie proportion. Consequently, it can be marketed from this standpoint.</li> <li>• An avocado farm is very lucrative and has a business life of approximately 40 years.</li> </ul>	<p>Avocados are grown as a monoculture, which means that the same crop (avocado trees) grows in the same land year after year, for many years. This mass-scale agricultural technique can make the production of avocados unsustainable as the practice of monoculture leave the soil with less nutrients and more vulnerable to diseases. To mitigate against this, the increased use of pesticides and fertilizers are undertaken which affects the quality of the product.</p>
<b>Opportunities</b>	<b>Threats</b>
<p>There is an emerging market for the value-added product, avocado oil. The demand is expected to increase over a 7 year period owing to its extensive use in cooking. Avocado oil is also used for the treatment of major health related problems such as coronary heart diseases and cholesterol. Avocado oil is used in various applications, such as in cosmetics, personal care and medicinal applications.</p>	<ul style="list-style-type: none"> <li>• The market for fruit is very volatile as it applies to both the price and quantity. Growers do not have control over either of these market components. Because of this, avocado production is a high-risked enterprise. Risk is caused by uncontrollable factors such as a decrease in the demand for avocados, an oversupply from other sources or theft. Because of the risk involved, access to a market is crucial. A market channel should be determined before any avocado production begins.</li> <li>• It is believed that avocado farming is responsible for deforestation, the destruction of ecosystems and a contributor to climate change. A kilo of avocados requires some 2000 liters of water to grow.</li> </ul>

## Market Analysis

### Export market prices for Jamaica avocados

Prices for Jamaica avocados have changed over time. Before 2019, a kilogram of avocados was going for US\$2.08 in 2017 and US\$2.03 in 2018. In 2019 the export price changed to \$2.05 per kilo, by 1.033%.

Some of the best performing markets in 2019 for Jamaica avocados per kilogram were from exports to United Kingdom (UK), US and Canada. The exports of avocados from Jamaica are categorised as:

- Fresh or dried avocados (HS code 080440)

### Export values for Jamaica avocados

The total values in export for avocados in Jamaica were US\$286, US\$274,000.00, US\$308,000.00 and US\$261,000.00 for the years 2016, 2017, 2018 and 2019 respectively.

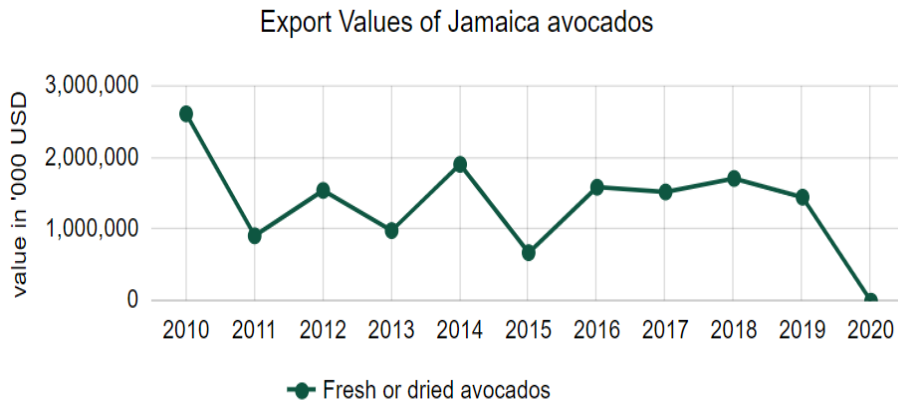


Figure 1: value of the Jamaican export market for avocado

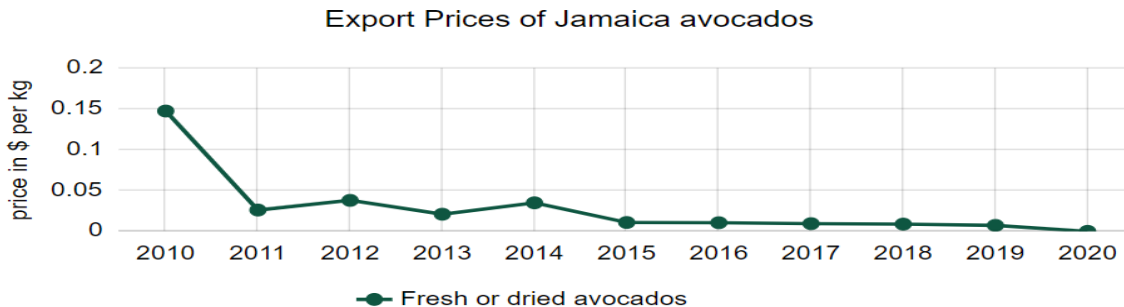


Figure 2: comparison of export prices from 2010-2020

The prices of avocados in Jamaica per tonne for the years 2016, 2017, 2018 and 2019 were US\$ 2,576.58, US\$ 2,075.76, US\$ 2,026.32 and US\$ 2,055.12 respectively.

### **Jamaica avocados wholesale price**

In 2021, the approximate price range for Jamaica Avocados is between US\$ 2.06 and US\$ 2.03 per kilogram or between US\$ 0.93 and US\$ 0.92 per pound(lb).

The price in Jamaican Dollar is JMD 313.76 per kg. The average price for a tonne is US\$ 2055.12 in Montego Bay and Kingston.

Jamaica's import price for avocados in 2019 was US\$0.32 per kg.

### **Jamaica avocados export quantities**

In 2019 Jamaica shipped 127 tonnes of avocados. Across 2019 alone, the demand for Jamaica avocados (fruits category) has decreased, changing by -16.447 per cent compared to the year 2018. Between 2017 and 2019, avocados' exports went down by -3.79% netting the nation US\$0.26m for the year 2019. Jamaica's avocados exports are categorised as:

- Fresh or dried avocados (HS code 080440)

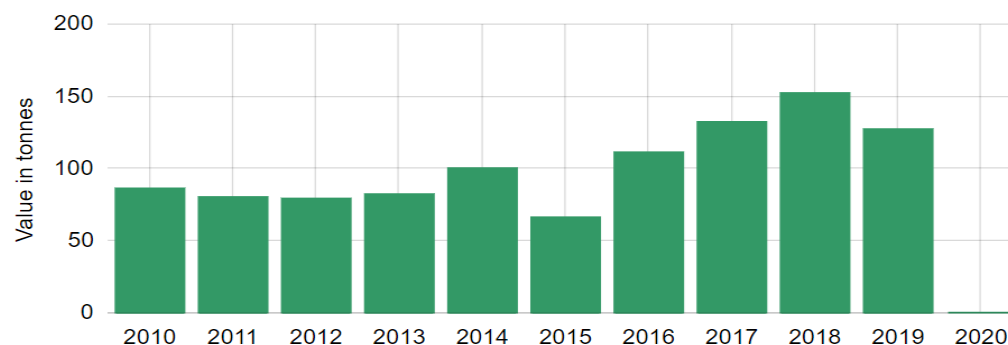


Figure 3: The amount of avocado exported from Jamaica in 2010-2020

### **Jamaica avocados export values**

In 2019, Jamaica supplied avocados costing 0.26M USD, a decrease of -15.58% from 2018's total avocados export of 0.308M USD. The yearly reduction in value of Jamaica avocados between 2017 to 2018 was 12.409 per cent.

The yearly change in the amount of Jamaica's avocados exports between 2017 and 2019 was -3.79 pc compared to a variation of -16.447% in the period between 2018 and 2019.

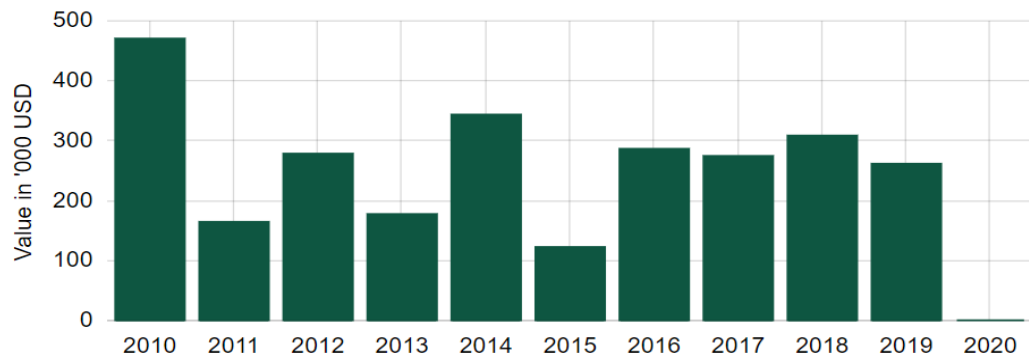


Figure 4: Export markets for Jamaica avocados (in '000\$)

	Country	Export %	Value							
			'013	2014	2015	2016	2017	2018	2019	2020
1	Canada	64.93%	.10K	\$81.98K	\$54.63K	\$104.12K	\$135.31K	\$110.28K	\$117.31K	\$67.52K
2	United Kingdom	35.07%	.01K	\$247.04K	\$54.46K	\$66.61K	\$83.20K	\$112.30K	\$81.20K	\$36.47K

Figure 5: Jamaica's best performing destinations for avocados are Canada, United Kingdom (UK) and US.

Source: Tridge

### **Production**

The production of avocados in Jamaica was 2,321 tonnes in 2019 and is projected to change by an average of -1.78%. The country had an estimated 363.00 hectares under avocados cultivation.

# Business Model and Financial Analysis for Investment in Avocado Farming

## INVESTMENT OPPORTUNITY

*Opportunity for Investment in Avocado Orchard*

**J\$8.5 M investment in greenfield investment opportunity for a 20 acres avocado orchard.**

Sell produce (washed and packaged) to domestic buyers, processors and exporters for local and international markets.

Requires investments in drip irrigation infrastructure and equipment.

**The first crop is expected to occur 3 years after planting.**

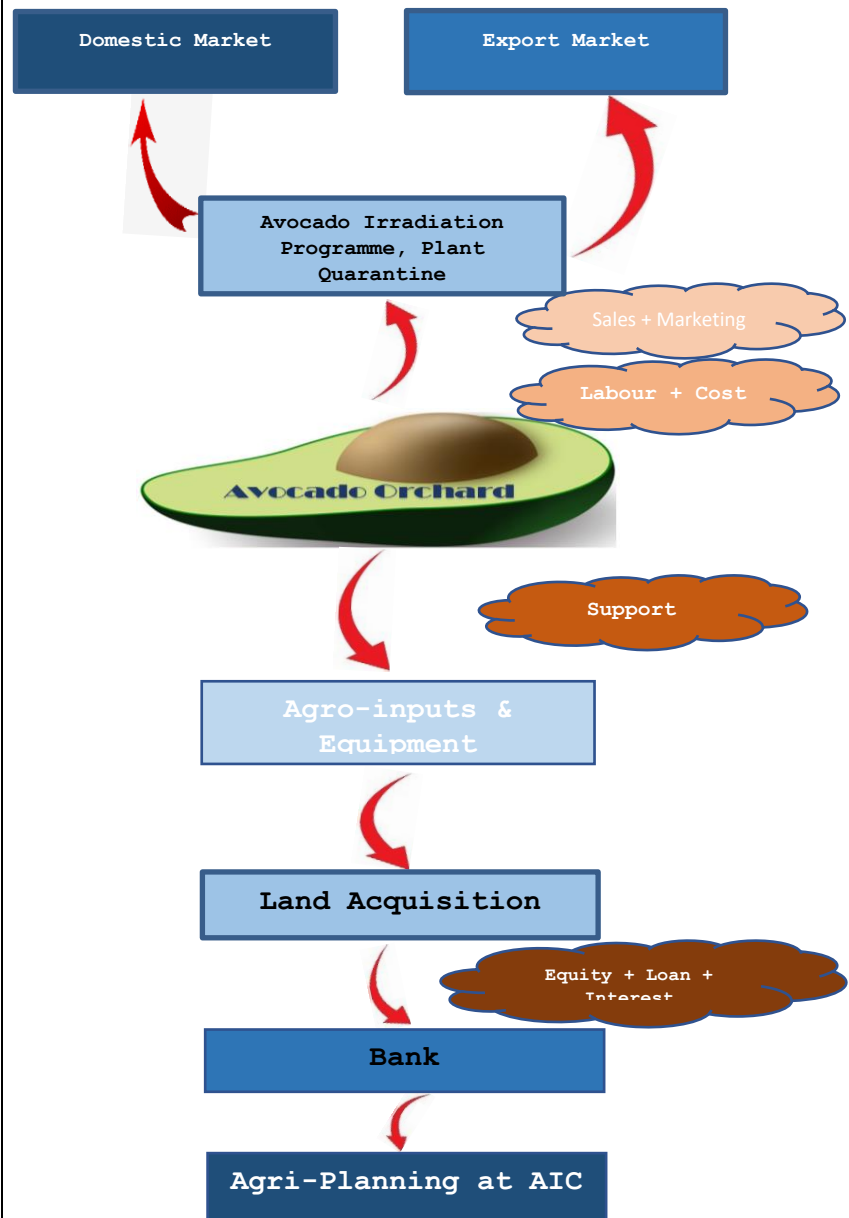
The investment will be financed by 60% equity and 40% loan financing at an interest rate of 6%

The estimates are made for a 20-acre area of production.

Land rate is J\$10,000 per acre per annum.

## BUSINESS MODEL

**115% Internal Rate of Return (IRR)**



## FINANCIALS

### Investment Cost

The initial investment is estimated at J\$8.5M (See Appendix 1 - Cost of Production).

### Revenue

Estimated revenue for the seven years is expected to amount to J\$476.5M (See Appendix 3 – Revenue Projection).

### Return on Investment

The estimated financials of the project are promising show an Internal Rate of Return (IRR) of 115% and Net Present Value (NPV) of J\$502.9M when future cash flows were discounted utilizing a rate of 10% percent based on the going bank lending rate (See Appendix 4 – NPV and IRR)

### Projected Cash Flow

The cash flow projections for avocado production on a 20 acre orchard are negative for the first three years and then becomes positive for the remainder of seven-year period. The net cash flow after debt service is expected to average J\$114.2 (See Appendix 4).

## Agricultural Incentives and Support Services

A 20-acre avocado orchard project can benefit from agricultural incentives which comprises of two levels, the general approval for benefits of the Productive Inputs Relief (PIR) and the higher level approval that includes Income Tax relief. An entity or individual must be registered with the Rural Agricultural Development Authority (RADA) in their respective parish offices in which the farm exists to benefit from the Productive Input Relief Incentive for the Agricultural Industry. The approval for the Productive Input Relief benefit requires that the Commissioner of Customs be satisfied that the items imported are to be used in primary production/approved farming activity. It should be noted that PIR can last from six (6) months to three (3) years. A farmer can also benefit from a twenty percent (20%) concession on farm vehicles. For a 20-acre avocado orchard, there is a limit to the number of vehicles. Medium Farms (11-50 acres) can benefit from two motor vehicles every five years.

### Support Services

#### Agro-Investment Corporation (AIC)

The Agro-Investment Corporation (AIC) is an agricultural investment facilitation, advisory and management agency, which functions as the Ministry of Agriculture and Fisheries business facilitation department. The agency is responsible for agricultural investment promotion and facilitation, as well as project and market development. AIC provides investment support to entrepreneurs, covering the investment chain from the identification of opportunities through to feasibility studies, business planning, fundraising, operations management, long term business performance monitoring and technical support.



#### Jamaica Promotions Corporation (JAMPRO)

JAMPRO's continuous mission is to promote Brand Jamaica, attract and land jobs and wealth-creating investments to Jamaica and secure lucrative markets for quality Brand Jamaican products. As the Agency seeks to facilitate local investments, a number of support services are available, namely:

- Provision of business information and advisory services
- Export-related training
- Creation of business linkages

#### Rural Agricultural Development Authority (RADA)

The Rural Agricultural Development Authority (RADA) promotes agricultural development in Jamaica through an extension service. Farmers can solicit information and technical assistance in areas such as agronomy, plant health, irrigation post-harvest techniques, production and marketing.

#### *Value-Added Support Services*

#### Jamaica Manufacturers and Exporters Association (JMEA)

The Jamaica Manufacturers & Exporters Association (JMEA) serves as the voice of exporters, manufacturers, service providers micro, small and medium enterprises (MSMEs). The JMEA provides vital support to the industry through advocacy, strategic partnerships, export services, research, capacity building and access to finance. The JMEA remains instrumental in helping local companies expand and export which is evident in the long-term success of renowned Jamaican brands.

#### Bureau of Standards Jamaica (BSJ)

The Bureau of Standards Jamaica is a statutory body established by The Standards Act of 1969 to promote and encourage standardization in relation to commodities, processes and practices. However, over the years, its role has expanded to include the provision of services in relation to conformity assessment (certification, testing and calibration) and metrology.

#### Scientific Research Council (SRC)

The SRC supports the growth and development of the agro-industrial sector in Jamaica through research, adaptation of available technologies, creation of new and appropriate technologies and the provision of training and technical assistance. The Scientific Research Council is the only institution with a mandate by law to "collect, collate and review information concerning scientific research schemes or programmes relevant to the development of the resources of Jamaica (and) to establish and maintain a scientific information center for collection and dissemination of scientific and technical information".

Contact our Investment Team today for more information on available investment opportunities!

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## Appendix

### Appendix 1: Cost of Production

<b>Parish</b>	<b>St. Catherine</b>			
<b>Crop</b>	<b>Avocado</b>			
<b>Crop Maturity</b>	<b>3 years</b>			
<b>Reaping Period</b>	<b>2 Months</b>			
<b>Planting Distance (I x w)</b>				
<b>inches</b>	<b>20 x 15</b>			
<b>Plant Population</b>	<b>145</b>			
<b>Topography</b>	<b>sloping land</b>			
<b>Land Preparation</b>	<b>Mechanical</b>			
<b>Irrigated/Rain fed</b>	<b>Irrigated</b>			
<b>Area</b>	<b>0.4 hectare</b>			
<b>Man-day Charge (excluding lunch)</b>	<b>\$2,000</b>			
<b>Projected Marketable Yield (Kg)</b>	<b>6,580</b>			
<b>Cost of Production \$</b>		unit	cost per unit	total cost
<b>Land Preparation</b>				
soil analysis (NPK, pH, organic matter)		1	3500	3,500
Brushing, plough, harrow, cut pegs	MD	29	2000	58,000
preperation of hole	each	70	60	4,200
Field layout (lining of field)	per hole	70	15	1,050
fertilizing (Placement)	MD	3	2000	6,000
<b>subtotal</b>				<b>72,750</b>
<b>Material</b>				
Seedlings	each	70	300	21,000
fertilizer	50kg bag	2	6000	12,000
fertilizer (urea)	50kg bag	2	5500	11,000
herbicide	1 gallon	1	5000	5,000
fungicides (Ridomi/Mancozeb)	500g	1	3000	3,000
organic matter	50lbs	2	1500	3,000
<b>Subtotal</b>				<b>55,000</b>
<b>Establishment &amp; Maintenance</b>				
transportation (inputs)		1	5000	5,000
planting & dropping	MD	2	2000	4,000
herbicide application	MD	2	2000	4,000
organic matter (placement in hole)	per hole	70	60	4,200
fertilizing (Placement)	MD	2	2000	4,000
weeding	MD	6	2000	12,000
pruning	per plant	70	50	3,500
harvesting	MD	10	2000	20,000
Transportation	MD	3	2000	6,000
Lunch		57	500	28,500
<b>Subtotal</b>				<b>91,200</b>
lease annually		1	10000	<b>10,000</b>
<b>Irrigation Cost</b>				

Drip hoses and fittings		1	200000	200,000	
<b>Total Irrigation cost</b>				<b>200,000</b>	Cost for 20 Acres
<b>TOTAL COST OF PRODUCTION</b>				<b>\$ 428,950.00</b>	\$ 8,579,000.00

Appendix 2: Operating Cost

	Avocado( YR 0)	YR1	YR2	YR3	YR4	YR5	YR6	YR7
<b>Direct expenses</b>								
LABOUR	\$ 1,824,000.000	\$ 1,824,000.00	\$ 3,830,400.00	\$ 4,021,920.00	\$ 4,223,016.00	\$ 4,434,166.80	\$ 4,655,875.14	\$ 4,888,668.90
Planting material	\$ 1,100,000.000	\$ 1,100,000.00	\$ 2,310,000.00	\$ 2,425,500.00	\$ 2,546,775.00	\$ 2,674,113.75	\$ 2,807,819.44	\$ 2,948,210.41
<b>Total Direct expenses</b>	<b>\$ 2,924,000.000</b>	<b>\$ 2,924,000.00</b>	<b>\$ 6,140,400.00</b>	<b>\$ 6,447,420.00</b>	<b>\$ 6,769,791.00</b>	<b>\$ 7,108,280.55</b>	<b>\$ 7,463,694.58</b>	<b>\$ 7,836,879.31</b>
<b>Indirect expenses</b>								
Land prep	\$ 1,455,000.000	\$ 1,455,000.00	\$ 1,527,750.00	\$ 1,604,137.50	\$ 1,684,344.38	\$ 1,768,561.59	\$ 1,856,989.67	\$ 1,949,839.16
land lease	\$ 200,000.000	\$ -	\$ 200,000.00	\$ 200,000.00	\$ 200,000.00	\$ 200,000.00	\$ 200,000.00	\$ 200,000.00
Total Indirect expenses	<b>\$ 1,655,000.000</b>	<b>\$ 1,455,000.00</b>	<b>\$ 1,727,750.00</b>	<b>\$ 1,804,137.50</b>	<b>\$ 1,884,344.38</b>	<b>\$ 1,968,561.59</b>	<b>\$ 2,056,989.67</b>	<b>\$ 2,149,839.16</b>
total Operating expenses for 20 acres	<b>\$ 4,579,000.000</b>	<b>\$ 4,379,000.00</b>	<b>\$ 7,868,150.00</b>	<b>\$ 8,251,557.50</b>	<b>\$ 8,654,135.38</b>	<b>\$ 9,076,842.14</b>	<b>\$ 9,520,684.25</b>	<b>\$ 9,986,718.46</b>

## Appendix 3

Appendix 3: Revenue Projection

Revenue Projection

Description	YR1	YR2	YR3	YR4	YR5	YR6	YR7 +
Yeild (Kg)	0	0	6580	13160	26300	52620	90720
# of Cyles	0	0	2	2	2	2	2
Acreage/hectare	20	20	20	20	20	20	20
Price per kg	98	103	108	113	119	125	131
<b>Total Revenue (Annually)</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$28,437,444.00</b>	<b>\$ 59,718,632.40</b>	<b>\$ 125,313,832.35</b>	<b>\$ 263,259,108.41</b>	<b>\$ 476,568,027.95</b>

## Appendix 4



Appendix 4: Cashflow Statement

Cash Flow Projections

Projected Cash Flow								
Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7+
<b>Inflows</b>								
Revenues		-	-	28,437,444.00	59,718,632.40	125,313,832.35	263,259,108.41	476,568,027.95
Loan (60%)	5,147,400.00							
Equity (40%)	3,431,600.00							
<b>Total Inflows</b>	<b>8,579,000.00</b>	<b>-</b>	<b>-</b>	<b>28,437,444.00</b>	<b>59,718,632.40</b>	<b>125,313,832.35</b>	<b>263,259,108.41</b>	<b>476,568,027.95</b>
<b>Less Outflows</b>								
Capital costs								
Capital Replacement							4,000,000.00	
Operating costs		6,574,000.00	1,865,450.00	1,956,222.50	2,051,533.63	2,151,610.31	2,256,690.82	2,367,025.36
<b>Total Outflows</b>	<b>8,579,000.00</b>	<b>6,574,000.00</b>	<b>1,865,450.00</b>	<b>1,956,222.50</b>	<b>2,051,533.63</b>	<b>2,151,610.31</b>	<b>6,256,690.82</b>	<b>2,367,025.36</b>
<b>Net Cash flow Before Debt Service</b>		<b>(6,574,000.00)</b>	<b>(1,865,450.00)</b>	<b>26,481,221.50</b>	<b>57,667,098.78</b>	<b>123,162,222.04</b>	<b>257,002,417.59</b>	<b>474,201,002.59</b>
<b>Debt Service:</b>								
Principal		\$542,564.27	\$596,820.70	\$656,502.77	\$722,153.04	\$794,368.35	873,805.18	961,185.70
Interest		514,740.00	460,483.57	\$400,801.50	\$335,151.23	\$262,935.92	183,499.09	96,118.57
<b>Total Debt Service</b>		<b>1,057,304.27</b>	<b>1,057,304.27</b>	<b>1,057,304.27</b>	<b>1,057,304.27</b>	<b>1,057,304.27</b>	<b>1,057,304.27</b>	<b>1,057,304.27</b>
<b>Net Cash flow after Debt Service</b>	<b>(8,579,000.00)</b>	<b>(7,631,304.27)</b>	<b>(2,922,754.27)</b>	<b>25,423,917.23</b>	<b>56,609,794.51</b>	<b>122,104,917.77</b>	<b>255,945,113.32</b>	<b>473,143,698.32</b>
<b>Cumulative Net Cash flow</b>	<b>(8,579,000.00)</b>	<b>(7,631,304.27)</b>	<b>(10,554,058.54)</b>	<b>14,869,858.69</b>	<b>71,479,653.20</b>	<b>193,584,570.97</b>	<b>449,529,684.29</b>	<b>922,673,382.60</b>

## Appendix 5

### Appendix 5: Depreciation Schedule

Annual Depreciation Schedule				
Item	Total	Useful Life	Salvage Value	Annual Dep.
Irrigation System	1,000,000.00	5	0	200,000.00
<b>Total Depreciation</b>				<b>200,000.00</b>

## Appendix 6

Appendix 6: Profit & Loss Projection

<b>Projected profit and Loss Statement</b>							
<b>Income</b>	<b>PY1</b>	<b>PY2</b>	<b>PY3</b>	<b>PY4</b>	<b>PY5</b>	<b>PY6</b>	<b>PY7</b>
Revenue	-	-	28,437,444.00	59,718,632.40	125,313,832.35	263,259,108.41	476,568,027.95
Less Direct Expenses	2,924,000.00	6,140,400.00	6,447,420.00	6,769,791.00	7,108,280.55	7,463,694.58	7,836,879.31
<b>Gross Margin</b>	<b>(2,924,000.00)</b>	<b>(6,140,400.00)</b>	<b>21,990,024.00</b>	<b>52,948,841.40</b>	<b>118,205,551.80</b>	<b>255,795,413.83</b>	<b>468,731,148.64</b>
Less							
Indirect Expenses	1,455,000.00	1,727,750.00	1,804,137.50	1,884,344.38	1,968,561.59	2,056,989.67	2,149,839.16
Interest	514,740.00	460,483.57	400,801.50	335,151.23	262,935.92	183,499.09	96,118.57
Depreciation	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00
<b>Total</b>	<b>2,169,740.00</b>	<b>2,388,233.57</b>	<b>2,404,939.00</b>	<b>2,419,495.61</b>	<b>2,431,497.51</b>	<b>2,440,488.76</b>	<b>2,445,957.73</b>
<b>Net Profit/loss</b>	<b>(5,093,740.00)</b>	<b>(8,528,633.57)</b>	<b>19,585,085.00</b>	<b>50,529,345.80</b>	<b>115,774,054.29</b>	<b>253,354,925.07</b>	<b>466,285,190.92</b>
Accumulated Net Profit/loss	(5,093,740.00)	(13,622,373.57)	5,962,711.43	56,492,057.23	172,266,111.51	425,621,036.58	891,906,227.49

