



MINISTRY OF AGRICULTURE  
FISHERIES & MINING

THE NEW  
**F.A.C.E.**  
OF **FOOD**



**AGRO-INVEST**  
AGRO-INVESTMENT CORPORATION

# INVEST — IN — JAMAICA'S AGRICULTURAL FUTURE

## INVESTMENT FOCUS ON PUMPKIN



## Table of Content

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Executive Summary.....	3
Product Profile - Pumpkin.....	4
Agronomics of Pumpkin.....	5
Harvest and Storage.....	9
Swot Analysis for Producing Pumpkin in Jamaica.....	10
Market Analysis of the Pumpkin.....	11
Business Model and Financial Analysis for Investment In Pumpking Farming.....	15
Agricultural Incentives And Support Services.....	17
List of figures	
– Figure 1: Export priced of Jamaica pumpkin, squash and gourd 2010-2020.....	13
Figure 2: Jamaica pumpkin, squash and gourd producer price 2021-2021.....	13
List of Tables	
– Table 1: Calabaza Pumpkin planting profile .....	9
Table 2: SWOT Analysis of the Calabaza Pumpkin .....	10
Table 3: Major recipients of Jamaican pumpkins .....	11
List of Appendices	
– Cost of Production –Appendix 1.....	19
Operating Cost – Appendix 2 .....	22
Revenue Projection – Appendix 3.....	23
Cashflow Statement –Appendix 4.....	25
Depreciation Schedule –Appendix 5.....	27
Profit & Loss Projection –Appendix 6.....	28

## Executive Summary

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Farm Size:	5 acres (2.02 hectares)
Project Description:	<p>The project is seeking to establish a 5-acre pumpkin farm.</p> <p>The average annual net profits over a 7-year period are projected to be approximately J\$2.9M</p> <p>The accumulated 7-year net profit is projected to be approximately J\$12.01M.</p> <p>Capital Investment Cost: J\$2.2M</p>
Project Sector:	Agriculture: Crop Production of Pumpkin

## Product Profile - Pumpkin



Assortment of the different species of pumpkin



**Botanical Name and Origin:** The botanical name of pumpkin is *Cucurbita Moschata*. It has its origins in Central America over 7,500 years ago. Pumpkins are believed to have originated in Central America over 7,500 years ago. The existence of pumpkin in Jamaica predates the 17<sup>th</sup> century.

**Species:** There are 45 different species of pumpkin. The species of Jamaican pumpkin is called Calabaza.

**Fruit Description:** The pumpkin is a creeping, annual tropical vine with large lobed leaves and branching tendrils; the flesh of the fruit is bright orange. The flowers are yellow. The leaves are mottled and grayish green in color. The fruits vary in size, shape and color owing to outcrossing and strain selection.

The fruit can weigh from about 3-90 pounds and is round and flattened a bit on the top and bottom. The color associated with the Calabaza is mottled green or yellow and buff cream with a sweet taste.

**Medicinal Uses:** It is a good source of the B-complex group of vitamins such as folates, niacin, Vitamin B-6 (pyridoxine), thiamin and pantothenic acid. It is also a rich source of minerals like copper, calcium, potassium and phosphorus.

Oils can be extracted from the seeds of the pumpkin. This oil can subsequently be used to make medicine for treatment of bladder irritation, kidney infections, intestinal worms, and trouble urinating due to benign prostatic hyperplasia (BPH). Pumpkin is sometimes used in combination with herbs to treat symptoms of BPH.

The zinc in pumpkin seeds protects the prostate and other sex organs.

The leaves of calabaza are used to make a tea that fights against stomach inflammation and jaundice.

**Value Added Products:** the following value added for pumpkin: jam, jelly, marmalades, puree, sauces, chutney, pickle, cookies and weaning mix, pies and beverages.

## **Agronomics of the Pumpkin**

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

The Calabaza Pumpkin tolerates hot weather conditions like that of Jamaica. As such, the pumpkin can be grown all year round. However, it tends to thrive more when the seasons are transitioning from spring to summer or from fall to winter. Both male and female flowers are produced on each plant and fruit shape, size, and appearance are quite variable, ranging from smooth and small (under 3 pounds) to ribbed and quite large (more than 90 pounds).

### **Site Selection**

Pumpkins should be grown on soils that have good water infiltration rates and good water-holding capacity. If pumpkins are going to be grown on sandy soils, access to irrigation is important to obtain optimum plant growth, uniform fruit set, and development. Soil pH should be in the 5.8-6.6 range with minimum soil compaction.

Pumpkins are very sensitive to cold temperatures (below 50°F) and plants and fruit will exhibit injury from even a slight frost. The best average temperature range for pumpkin production during the growing season is between 65 and 95°F; temperatures above 95°F or below 50°F slow growth and maturity of the crop. Pumpkins require a constant supply of available moisture during the growing season. Water deficiency or stress, especially during the blossom and fruit set periods, may cause blossoms and fruits to drop, resulting in reduced yields and smaller-sized fruits.

### **Planting and Fertilization**

When the pumpkins are seeded in the field, the farmer should ensure that the soil temperature is no cooler than at least 60°F three inches beneath the soil surface. Pumpkins seeded in soils cooler than the aforementioned temperature may suffer from seed corn maggot injury. No-till pumpkins can be seeded with a no-till planter or transplanted in a minimally prepared bed with only secondary tillage such as an s-tine cultivator or in a previously tilled field without any tillage treatment, saving both time and labour. Because pumpkin seed germinates and develops optimally when soil temperatures are at least 60°F, the Jamaican climate is typically conducive to support early pumpkin production using no-till. Consequently, the soil temperatures in a no-till Jamaican field are warm enough for rapid pumpkin seed germination and growth. In addition, no-till reduces soil moisture loss early in the season and has more water available for pumpkin plant growth later in the season. If considering no-till pumpkin production, the following factors must be considered to be successful: variety, planting date, soil fertility practices, insect pressure and control, planting equipment, cover crop type and stand, and weed species and population distribution in the field.

Because pumpkins are a warm-season crop, they can also be grown as transplants on raised beds with black or silver plastic mulch and drip irrigation for optimum plant growth and yields. The use of plasticulture in the production of pumpkins will:

- Maintain soil water availability

- Reduce weeds
- Improve soil tilth
- Reduce fertilizer and pesticide leaching under the bed

Use of drip irrigation also allows for fertilizer application (injection) throughout the growing season. Growing pumpkins using plasticulture will double the yield of pumpkins grown on bare soil or in no-till production.

Pumpkins are generally planted as single rows with 30-40 inches between plants in the row and 8-12 feet between rows, depending on plant type. Plant populations at these spacing are approximately 1,600 (for pumpkins in excess of 30 pounds) to 2,800 plants per acre (for pumpkins less than 8 pounds).

Fertilizer recommendations are based on soil test results, and soil tests should be taken every year. In absence of soil test results, recommended N-P-K application rates are 80-150-150 broadcast or 40-75-75 banded at planting. Soil calcium levels should be checked; if soils are testing low or low to medium in calcium and have not received any calcific (calcium-based) lime applications, apply gypsum to the field in bands where rows will be planted prior to planting pumpkins. Gypsum will supply calcium to the soil without changing soil pH.

### Pollination

Honeybees are important for proper, complete pollination and fruit set. One hive per acre is the recommended population of honeybees for maximum fruit production. Populations of pollinating insects may be adversely affected by insecticides applied to flowers or weeds in bloom.

### Pest Control

Below are some of the common pests that will deter the farmer/investor from reaping healthy pumpkins:

**Melon worm** *Diaphania hyalinata* is a key pest of pumpkin in Jamaica. This species is distinguished from closely related species by the presence of a white stripe extending the length of both sides of the body at the 5<sup>th</sup> larval stage. Melon worm larvae prefer foliage but with severe infestations they may feed on pumpkin flowers and fruits. Infestation levels are higher after a period of rainfall.

Natural enemies play a key role in suppressing melon worm populations. At the Bodles Agricultural Research Station, the paper wasp (*Polistes* sp.) was very active in pumpkin plots and was effective in keeping the melon worm population below a given threshold provided conditions were favourable to the wasp.

Adults of the **banded cucumber beetle** (*Diabrotica balteata*) are foliage feeders. Eggs are laid on the soil surface in crevices and larvae will feed on pumpkin roots and roots of other crops (e.g. corn and pepper). Banded cucumber beetles belong to a group of beetles that are vectors of squash mosaic virus that causes extensive reduction in pumpkin production.

**Aphids** can cause direct feeding damage in high numbers. Sooty mold and ant activity may indicate their presence. They are also vectors of important cucurbit viruses. The melon aphid (*Aphis gossypii*) and green peach aphid (*Myzus persicae*) are vectors of cucumber mosaic virus and watermelon mosaic virus 2.

**Downy Mildew** caused by the fungus *Pseudoperonospora cubensis* is favoured by cool (night temperatures) wet conditions with prolonged leaf wetness. This disease is common during the mid to

late season of the crop. Crop rotation is not an effective control measure for this disease since infected plantings on neighbouring farms can still be a source of inoculum or means of spreading the fungi.

**Powdery mildew** caused by the fungus *Erysiphe cichoracearum* prevails under cool (night temperatures) dry conditions. This disease is also prevalent during the mid to late season of the crop.

**Phytophthora fruit rot** caused by the fungus *Phytophthora cactorum* develops when fruit come in contact with soil containing high moisture levels. Symptoms include soft, water-soaked spots on fruit with signs of white yeast-like growth. The disease is favoured by warm wet conditions.

The root knot nematode *Meloidogyne incognita* can be a limiting factor to pumpkin production. If pumpkin is planted in nematode infested soil, crop roots will become damaged, and plants will develop and yield poorly.

Control of weeds can be achieved with a good crop rotation system and herbicides. Pumpkins can be competitive with weeds once they develop their mature canopy, if they are planted at high plant populations, or if they are planted on plastic mulch. There are several pretransplant and postemergence herbicides labelled for pumpkins, depending on specific weed problems requiring control and stage of pumpkin growth. In addition, under mild infestation levels, early cultivation (if possible, prior to vine running) can minimize weed problems.

Several diseases of pumpkin can cause a reduction in crop yields, especially bacterial wilt, viruses (powdery mildew, downy mildew), and scab. Optimum crop yields and fruit colour may only be possible if a scheduled fungicide program is used to prevent leaf loss from mildews. Crop rotation, good soil and air drainage, and use of resistant varieties (where possible) can help reduce problems from these diseases in the field.

Many of the pesticides required for pumpkin production are restricted-use pesticides and require a pesticide license to purchase. Pesticide applicator tests are usually administered at county extension offices, so you should contact your local office for dates and times of these examinations. When using any pesticides in your enterprise, remember to follow all label recommendations regarding application rates and personal protection equipment (PPE) requirements. Also remember that the Worker Protection Standards (WPS) apply to the owner/farmer as well as to the field hands.

### **Planting Companion**

A variety of plants work well as pumpkin growing companions either because they help the pumpkin plant stay healthy and productive, or because the pumpkin plants aid them in some way, or both. One typical example of companion planting with pumpkins is interspersing corn, beans, and pumpkins in the same bed. The beans can use the cornstalks as support structures to climb up, while the massed foliage of pumpkins keeps down the weeds.

Melon and squash are also beneficial as pumpkin companion plants. Some plants that grow well with pumpkins are beneficial because they enhance the vegetable's flavour. Marjoram, if used as one of the pumpkin growing companions, is said to produce better tasting pumpkins. Nasturtiums keep bugs and beetles away. Marigold, oregano, and dill all repel destructive insects, like the dreaded squash bug.

Not every plant will be good for companion planting with pumpkins. Intercropping the wrong species can cause your pumpkins growing problems. For example, experts tell gardeners not to plant pumpkin near potatoes.

## **Environmental Impacts**

In the normal course of operations, farmers handle pesticides and other chemicals, may have manure to collect and spread, and use equipment to prepare fields and harvest crops. Any of these routine on-farm activities can be a potential source of surface or groundwater pollution. As this possibility exists, the farmer/investor must understand the regulations you must follow concerning the proper handling and application of chemicals, and the disposal and transport of waste. Depending on the watershed where the farm is located, there may be additional environmental regulations regarding erosion control, pesticide leaching, and nutrient runoff. Contact National Irrigation Commission (NIC), the Agro-Investment Corporation – Agro-Park Development and Production Zone Department (under the ambit of the Ministry of Agriculture) and National Environment and Planning Agency (NEPA) to determine what regulations may pertain to your operation. Of course, pumpkin farming done in the Agro-Invest’s Agro-Parks or Production Zone is monitored by a designated Farm Manager. Consequently, he will provide guidance in this regard.

## **Good Agricultural Practices and Good Handling Practices**

Good agricultural practices (GAPs) and good handling practices (GHPs) are voluntary programs that you may wish to consider for your operation. The idea behind these programs is to ensure a safer food system by reducing the chances for foodborne illnesses resulting from contaminated products reaching consumers. Also, several major food distribution chains are beginning to require GAP- and GHP-certified products from their producers. These programs set standards for worker hygiene, use of manure, and water supply quality.

Agro-Invest constantly promote and encourage the farmers in their Agro-Parks and Production Zones to be Global GAP Certified as it unlocks benefits such as:

- Ensuring access to your markets.
- Enhance operating efficiency and competitive market appeal.
- Demonstrate to clients (retailers, product traders, importers) that your product is produced using good agricultural/fish farming practices.
- Inspire consumer confidence.
- Implement processes for continual improvement; and
- Reduce the number of second party inspections to farms as more major retailers accept the scheme.

## Harvest and Storage

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Pumpkins are hand-harvested at their mature stage, colour and size. When you are able to thump the pumpkin with a finger, and it sounds hollow the pumpkin is ripe. Another method is to press your nail into the pumpkin's skin; if it resists puncture, it is ripe.

Because the fruits are pollinated at different times, multiple harvests over the field are quite common. Grading pumpkins for size, maturity, and pest damage before marketing is necessary to ensure a high-quality product. Maintaining pumpkin fruit in a dry, cool environment (a barn, for example) will help extend the shelf life of the crop and help maintain a non-shrunken fruit appearance.

Placing pumpkins in a well-ventilated storage area, preferably protected from rain, maintains healthy fruit for processing. Pumpkins will retain good quality for approximately 2-3 months if stored at the appropriate relative humidity (50-70 percent) and temperature (50-55°F).

Yield depends on several such as soil type/fertility, cultivar, irrigation, age of plants and plant management practices. Please see table 1 below for the planting profile of the Calabaza Pumpkin.

<b>Yield Potential</b>	15,000- 30,000 lbs/acre
<b>Equipment Requirements</b>	Tractor, shredder, disk, bedder, planter, herbicide sprayer, insect/disease sprayer, trailer and irrigation system
<b>Soil Requirements</b>	Medium to heavy, well-drained soil
<b>Water Requirements</b>	15 to 20 inches from June through September

Table 1: Calabaza Pumpkin planting profile

## SWOT Analysis for Producing Pumpkin in Jamaica

Table 2 summarizes the main internal and external factors that might positively and negatively affect the producers and exporters the Jamaican Calabaza.

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• Pumpkin is an annual plant. Consequently, the crop cycle is short (approximately 3 months). As of such, profits can be realized in a shorter time frame.</li> <li>• Pumpkin is not considered a seasonal crop as it can be grown successfully all year round in Jamaica give our tropical climate that conducive to the growth of pumpkin.</li> <li>• Cost of production is relatively cheaper than most cash crops.</li> <li>• Intercropping with pumpkin can bring nutrients to the soil that will result in the production of higher quality crops. However, intercropping must be done with crops that is not a threat to the pumpkin (like potatoes).</li> </ul>	<ul style="list-style-type: none"> <li>• Insects and pests – As common, pumpkin has a myriad of pests and insects that feed on it. Nontreatment of this condition will affect the level of production.</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Land Availability – Under the National Agro-park Program, Agro-Investment Corporation leases lands in Spring Plain, Plantain Garden River, Amity Hall and Ebony Park Agro-Parks that are conducive to the production of pumpkin. These lands are offered below market rental and come with a supporting knowledgeable skilled team that will assist the farmer/investor to monitor the agronomics of the pumpkin.</li> <li>• Jamaica Bodles Globe Pumpkin – these pumpkins seedlings are developed by the Bodles Research Station. The properties of which are: resistant to common pest of pumpkins; longer shelf life due to it being very dry; high yielding (20 tonnes per ha and compared to 9 to 18 tonnes per hectare for other varieties of pumpkin)</li> </ul>	<ul style="list-style-type: none"> <li>• Cyclonic Rainfall – In Jamaica, the hurricane season typically goes from June 1 to November 30. The season normally peaks in August and September. Pumpkin does not handle the torrential rains very well as hard rains will knock blossoms off their vines and affected yield</li> </ul>

Table 2: SWOT Analysis of the Calabaza Pumpkin

## Market Analysis of the Calabaza

Almost all of Jamaica's pumpkin are exported to Canada, United State and the United Kingdom. Table 3 shows that in 2020, the United Kingdom received 49.3% of the pumpkins while Canada received 32% and the United States received 18.6%.

Destination Country	Percentage of Pumpkins imported from Jamaica
Canada	32%
United States	18.6%
United Kingdom	49.3%
Total	99.9%

Table 3: Major recipients of Jamaican pumpkins

Pumpkins, squash and gourds is classified using the same Harmonized System (HS) Code 070993. The analysis presented below are thus relating to the HS code 070993 which will also include squash and gourd.

### Major Competitors Trading HS 070993 against Jamaica to US, Canada and UK in 2019

United Kingdom - The United Kingdom's global purchases of imported pumpkins totalled US\$82.2 million in 2019. Below are the top 15 suppliers from which the UK imported the highest dollar value worth of pumpkins during 2019.

1. Spain: US\$40.5 million
2. Netherlands: \$8.8 million
3. Portugal: \$5.8 million
4. South Africa: \$5.6 million
5. Germany: \$5.4 million
6. France: \$2.1 million
7. Greece: \$25 million
8. Italy: \$1.7 million
9. Argentina: \$1 million
10. Brazil: \$950,000
11. Costa Rica: \$897,000
12. Pakistan: \$780,000
13. Dominican Republic: \$707,000
14. Sri Lanka: \$608,000
15. India: \$602,000

By value, the listed 15 countries shipped 94.2% of pumpkins imported by the United Kingdom in 2019, of which Jamaica is not a part of even though the UK takes most of Jamaica's pumpkin.

Canada - Canada global purchases of imported pumpkins totalled US\$112.3 million in 2019. Below are the top 15 suppliers from which the Canada imported the highest dollar value worth of pumpkins during 2019.

1. Mexico \$79.46

2. USA \$16.88
3. Costa Rica \$US4.13 million
4. Honduras \$3.73 Million
5. Dominican Republic \$1.96 Million
6. China \$1.51 Million
7. Guatemala \$1.11 Million
8. India \$0.94 Million
9. South Africa \$0.44 Million
10. Serbia \$0.37 Million
11. Pakistan \$0.26 Million
12. Argentina \$0.26 Million
- 13. Jamaica \$0.23 Million**
14. Bangladesh \$0.16 Million
15. Brazil \$0.16 Million

By value, the listed 15 countries shipped 99.39% of pumpkins imported by the Canada in 2019. On this list, Jamaica is number 13 exports valued at Two Hundred and Thirty Thousand US Dollars.

United States – The US global purchases of imported pumpkins totalled US\$438.5 million in 2019. Below are the top 12 suppliers from which the US imported the highest dollar value worth of pumpkins during 2019.

1. Mexico: US\$393.2 million
2. Canada: \$20.8 million
3. Costa Rica: \$7.6 million
4. Honduras: \$6.6 million
5. Guatemala: \$4.1 million
6. Dominican Republic: \$3.1 million
7. Panama: \$1.2 million
8. Chile: \$1.2 million
9. Nicaragua: \$0.457 Million
10. Haiti: \$0.77 Million
- 11. Jamaica: \$0.47 Million**
12. New Zealand: \$0.34 Million
13. Belize: \$0.22 Million
14. Argentina: \$0.21 Million
15. Spain: \$0.15 Million

By value, the listed 15 countries shipped 99.996% of pumpkins imported by the United States in 2019. Jamaica is placed at number 11 on this list with Four Hundred and Seventy Thousand US Dollars.

The best performing markets in 2019 for Jamaica pumpkins per kilo were from exports to United Kingdom (UK). However, from the data above, the UK has a great demand for pumpkin. Regardless of this, Jamaica's contribution to their export market falls in the latter 5.8% of in value.

### **Export Market Prices for Jamaica Pumpkins**

Prices for Jamaica pumpkins have changed over time. Prior to 2019, one kg of pumpkins was going for US\$0.77 in 2017 and US\$0.97 in 2018. In 2019 the export price changed to \$0.94 per kilo, by -2.874%.

### Export values for Jamaica pumpkins

The total values in export for pumpkins in Jamaica were US\$ 245, US\$ 258, US\$ 242 and US\$ 318 in US dollar thousand for the years 2016, 2017, 2018 and 2019 in that order.

### Producer Prices

The producer prices of pumpkins, squash and gourds have changed across major pumpkins, squash and gourds production regions in Jamaica. 1 kilo of Jamaica Pumpkins, squash and gourds is around USD 0.80 in Kingston and Montego Bay, packed and ready for shipment. The price in JMD currency is 0.00524.

### Export prices of Jamaica pumpkin, squash and gourd

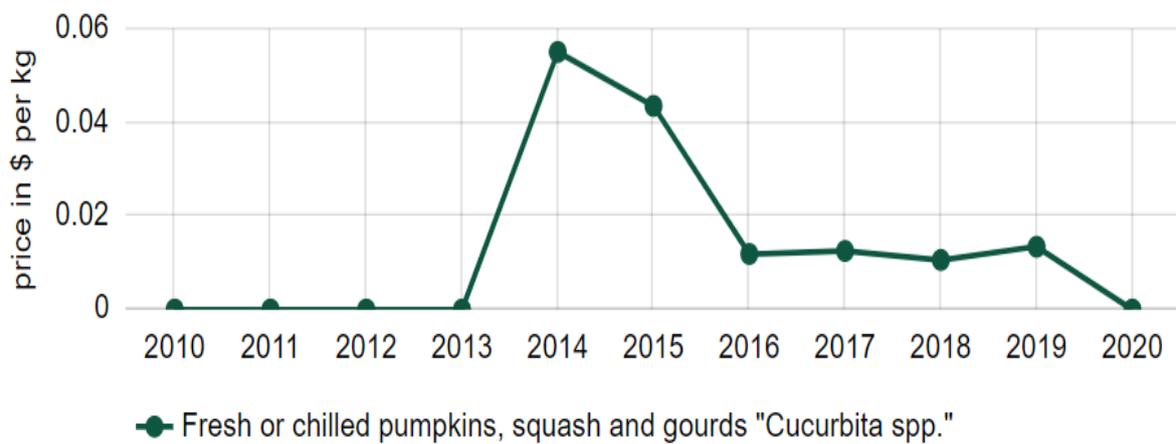


Figure 1: Export priced of Jamaica pumpkin, squash and gourd 2010-2020

The prices of pumpkins, squash and gourds in Jamaica per tonne for the years 2016, 2017, 2018 and 2019 were US\$ 646.44, US\$ 770.15, US\$ 971.89 and US\$ 938.05 respectively.

### Jamaica pumpkins, squash and gourds export values

The total values in export for pumpkins, squash and gourds in Jamaica were US\$ 245, US\$ 258, US\$ 242 and US\$ 318 in US dollar thousand for the years 2016, 2017, 2018 and 2019 in that order.

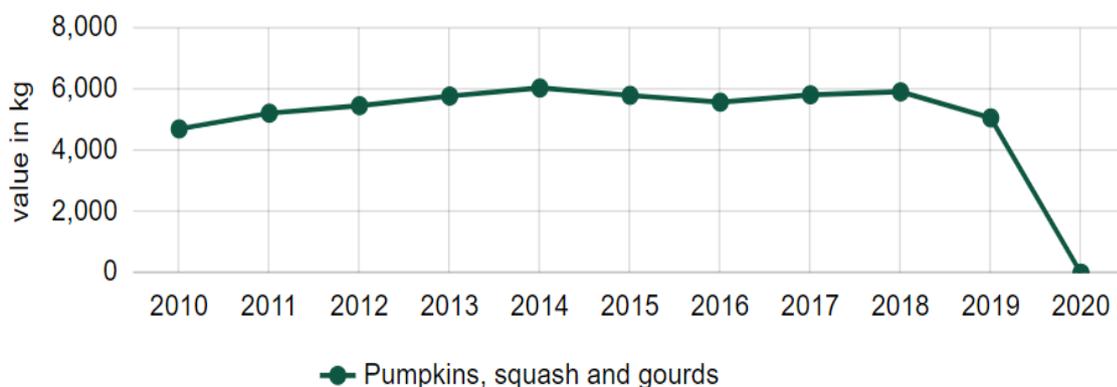


Figure 2: Jamaica pumpkin, squash and gourd producer price 2021-2021

### **Jamaica pumpkins, squash and gourds wholesale price**

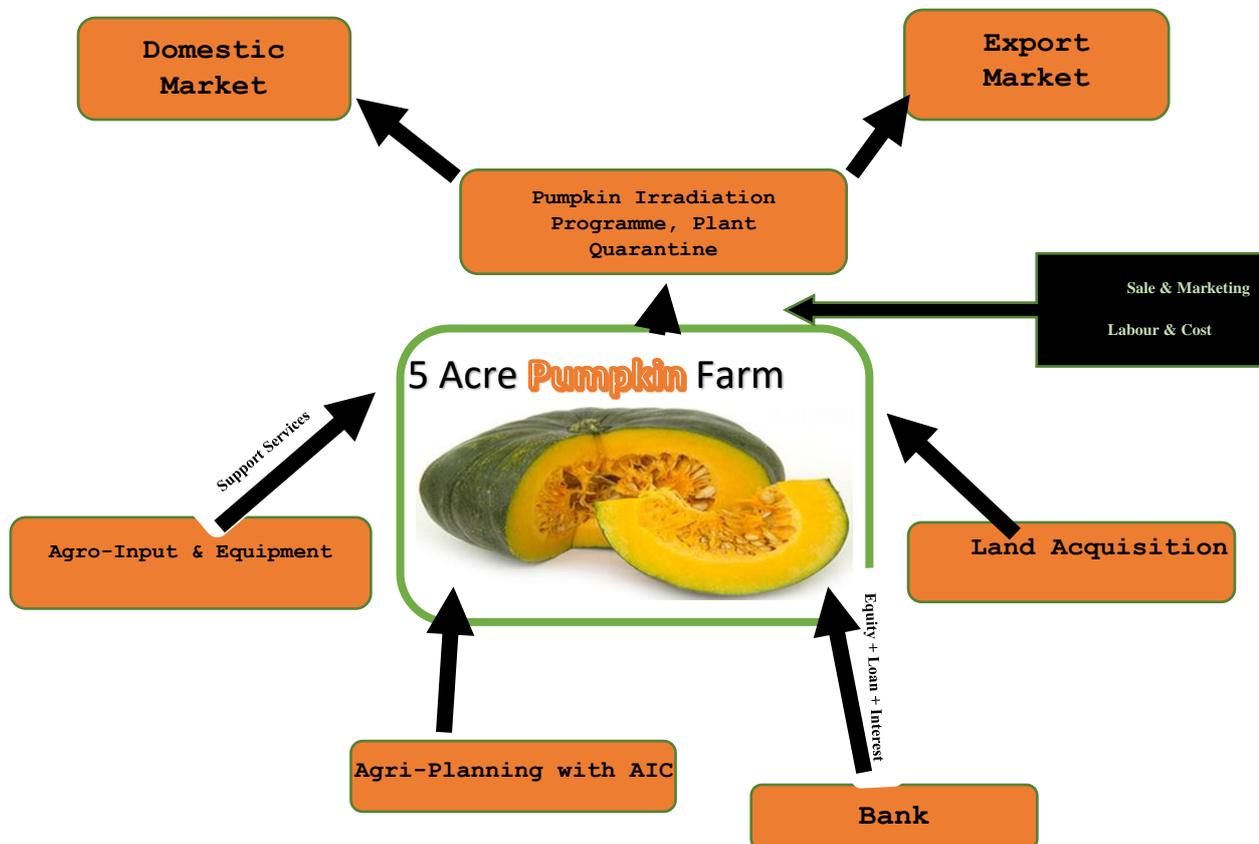
In 2021, the approximate price range for Jamaica Pumpkins, squash and gourds is between US\$ 0.94 and US\$ 0.97 per kilogram or between US\$ 0.43 and US\$ 0.44 per pound(lb).

The price in Jamaican Dollar is JMD 143.21 per kg. The average price for a tonne is US\$ 938.05 in Montego Bay and Kingston.

Jamaica's import price for pumpkins, squash and gourds in 2019 was US\$0.40 per kilo.

# Business Model and Financial Analysis for Investment in Pumpkin Farm

## Business Model



### Opportunity for Investment in a 5 Acres Pumpkin Farm

- J\$2.2M investment opportunity for a 5 acres pumpkin farm.
- 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 months after planting.
- The investment will be financed by 60% equity and 40% loan financing at an interest rate of 10%
- The estimates are made for a 5-acre area of production.
- Land rate is J\$10,000 per acre per annum.

## FINANCIAL ANALYSIS

### Investment Cost

The initial investment is estimated at J\$2.2M (See Appendix 1 - Cost of Production).

### Revenue

Estimated revenue for the seven years is expected to amount to J\$6.18M (See Appendix 3 – Revenue Projection).

### Return on Investment

The estimated financials of the project are promising show an Internal Rate of Return (IRR) of 140% and Net Present Value (NPV) of J\$12.48M 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 pumpkin production on a 5-acre orchard are negative for the first year and then becomes positive for the remainder of seven-year period. The net cash flow after debt service is expected to average J\$2.38M (See Appendix 4).

## **Agricultural Incentives and Support Services**

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A 5-acre pumpkin farm 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 5-acre pumpkin farm, 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

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## Appendix 1 – Cost of Production

<b>Parish</b>	<b>Clarendon</b>			<b>0</b>
<b>Crop</b>	<b>Pumpkin (Native)</b>			
<b>Crop Maturity</b>	<b>3 Months</b>			
<b>Reaping Period</b>	<b>2 Months</b>			
<b>Planting Distance (I x w)</b>				
<b>cm</b>	<b>300 x 120</b>			
<b>inches</b>	<b>120 x 48</b>			
<b>Plant Population</b>		<b>1089</b>		
<b>Topography</b>	<b>Relatively Flat</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>7,490</b>		
<b>Cost of Production \$/</b>				
Land Clearing	MD	6	2000	12,000
<b>SUBTOTAL</b>				<b>12,000</b>
<b>Labour</b>				
Ploughing	Tractor		25000	25,000
Planting	MD		2000	4,000
Pesticide Application	MD	4	2000	8,000
Weeding	MD	10	2000	20,000
Fertilising	MD	2	2000	4,000
Harvesting	MD	15	2000	30,000
Lunch	Each	39		19,500
<b>SUBTOTAL</b>				<b>110,500</b>
<b>Material Inputs</b>				
Planting Material	lbs	12	100	1,200
Water	month	5	2500	12,500
Fertiliser:				
NPK 14-28-14	50 lb bag	3	6000	18,000
Urea	50 lb bag	1	4500	4,500
Sulphate of Ammonia	50 lb bag	1	3400	3,400
Insecticide:				
Caratraz	litre	1	3000	3,000
Fungicide:				
Ridomil	500 g	1	2600	2,600
Sulcox	500 g	1	1300	1,300
Herbicide:				
Glyphosate	litre	3	1300	3,900
<b>SUBTOTAL</b>				<b>50,400</b>
Other Costs				
Contingencies (10 percent of labour and material)				17,290
**Tools discounted for 5 years				9,400
Land Charges per year				10,000
Supervision (15 percent of labour and material)				25,935
<b>SUBTOTAL</b>				<b>67,625</b>
<b>Irrigation Cost</b>				

Drip hoses and fittings		1	200000	200,000
<b>Total Irrigation cost</b>				<b>200,000</b>
<b>TOTAL OPERATING EXPENDITURE PER CROP CYCLE</b>				<b>440,525</b>
Initial land clearing cost are not included given the wide variations present				

Cost of production for 5 acres = \$ 2,202,625.00

## Appendix 2 – Operating Cost

Operating Cost								
	Pumpkin (YR 0)	YR1	YR2	YR3	YR4	YR5	YR6	YR7
<b>Direct expenses</b>								
LABOUR	552,500.00	552,500.00	1,160,250.00	1,218,262.50	1,279,175.63	1,343,134.41	1,410,291.13	1,480,805.68
Planting material	252,000.00	252,000.00	529,200.00	555,660.00	583,443.00	612,615.15	643,245.91	675,408.20
<b>Total Direct expenses</b>	<b>804,500.00</b>	<b>804,500.00</b>	<b>1,689,450.00</b>	<b>1,773,922.50</b>	<b>1,862,618.63</b>	<b>1,955,749.56</b>	<b>2,053,537.03</b>	<b>2,156,213.89</b>
<b>Indirect expenses</b>								
Land prep	60,000.00	120,000	126,000	132,300	138,915	145,861	153,154	160,811
land lease	50,000.00	0	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
Total Indirect expenses	<b>110,000.00</b>	<b>120,000.00</b>	<b>176,000.00</b>	<b>182,300.00</b>	<b>188,915.00</b>	<b>195,860.75</b>	<b>203,153.79</b>	<b>210,811.48</b>
Total Operating expenses for 5 acres	<b>914,500.00</b>	<b>924,500.00</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>2,256,690.82</b>	<b>2,367,025.36</b>

## Appendix 3 - Revenue Projection

Revenue Projection

Description	YR1	YR2	YR3	YR4	YR5	YR6	YR7
Yeild (Kg)	5992	5992	5992	5992	5992	5992	5992
# of Cyles	2	2	2	2	2	2	2
Acreage/hectare	5	5	5	5	5	5	5
Price per kg	77	81	85	89	94	98	103
<b>Total Revenue (Annually)</b>	<b>\$4,613,840.00</b>	<b>\$4,844,532.00</b>	<b>\$ 5,086,758.60</b>	<b>\$ 5,341,096.53</b>	<b>\$ 5,608,151.36</b>	<b>\$ 5,888,558.92</b>	<b>\$ 6,182,986.87</b>

## Appendix 4 - Cash Flow Projection

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		4,613,840.00	4,844,532.00	5,086,758.60	5,341,096.53	5,608,151.36	5,888,558.92	6,182,986.87
Loan (60%)	1,321,575.00							
Equity (40%)	881,050.00							
<b>Total Inflows</b>		<b>4,613,840.00</b>	<b>4,844,532.00</b>	<b>5,086,758.60</b>	<b>5,341,096.53</b>	<b>5,608,151.36</b>	<b>5,888,558.92</b>	<b>6,182,986.87</b>
<b>Less Outflows</b>								
Capital costs	2,202,625.00							
Capital Replacement							1,000,000.00	
Operating costs		924,500.00	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>2,202,625.00</b>	<b>924,500.00</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>3,256,690.82</b>	<b>2,367,025.36</b>
<b>Net Cash flow Before Debt Service</b>		<b>3,689,340.00</b>	<b>2,979,082.00</b>	<b>3,130,536.10</b>	<b>3,289,562.91</b>	<b>3,456,541.05</b>	<b>2,631,868.10</b>	<b>3,815,961.51</b>
<b>Debt Service:</b>								
Principal		\$216,470.66	\$238,117.72	\$261,929.49	\$288,122.44	\$316,934.69	-	-
Interest		132,157.50	110,510.43	\$86,698.66	\$60,505.71	\$31,693.47	-	-
<b>Total Debt Service</b>		<b>348,628.16</b>	<b>348,628.15</b>	<b>348,628.15</b>	<b>348,628.15</b>	<b>348,628.16</b>	<b>-</b>	<b>-</b>
<b>Net Cash flow after Debt Service</b>	<b>(2,202,625.00)</b>	<b>3,340,711.84</b>	<b>2,630,453.85</b>	<b>2,781,907.95</b>	<b>2,940,934.76</b>	<b>3,107,912.89</b>	<b>2,631,868.10</b>	<b>3,815,961.51</b>
<b>Cumulative Net Cash flow</b>	<b>(2,202,625.00)</b>	<b>3,340,711.84</b>	<b>5,971,165.69</b>	<b>8,753,073.64</b>	<b>11,694,008.40</b>	<b>14,801,921.29</b>	<b>17,433,789.39</b>	<b>21,249,750.90</b>

NPV                  IRR  
12,480,683.13          140%

## Appendix 5 – Depreciation Schedule

### 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 - Projected Profit and Loss Statement**

Projected Profit and Loss Statement							
Income	PY1	PY2	PY3	PY4	PY5	PY6	PY7
Revenue	4,613,840.00	4,844,532.00	5,086,758.60	5,341,096.53	5,608,151.36	5,888,558.92	6,182,986.87
Less Direct Expenses	804,500.00	1,689,450.00	1,773,922.50	1,862,618.63	1,955,749.56	2,053,537.03	2,156,213.89
<b>Gross Margin</b>	<b>3,809,340.00</b>	<b>3,155,082.00</b>	<b>3,312,836.10</b>	<b>3,478,477.91</b>	<b>3,652,401.80</b>	<b>3,835,021.89</b>	<b>2,156,213.89</b>
Less							
Indirect Expenses	120,000.00	176,000.00	182,300.00	188,915.00	195,860.75	203,153.79	210,811.48
Interest	132,157.50	110,510.43	86,698.66	60,505.71	31,693.47	-	-
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>452,157.50</b>	<b>486,510.43</b>	<b>468,998.66</b>	<b>449,420.71</b>	<b>427,554.22</b>	<b>403,153.79</b>	<b>410,811.48</b>
<b>Net Profit/loss</b>	<b>3,357,182.50</b>	<b>2,668,571.57</b>	<b>2,843,837.44</b>	<b>3,029,057.20</b>	<b>3,224,847.58</b>	<b>3,431,868.10</b>	<b>1,745,402.41</b>
Accumulated Net Profit/loss	3,357,182.50	6,025,754.07	8,869,591.51	11,898,648.71	15,123,496.29	18,555,364.39	20,300,766.80

