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**F.A.C.E.**  
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**AGRO-INVEST**  
AGRO-INVESTMENT CORPORATION

# INVEST

IN

# JAMAICA'S

## AGRICULTURAL FUTURE

# INVESTMENT FOCUS ON SWEET CORN



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Don't miss this chance to sow the seeds of success. Secure your spot in the Southern Plain Agro Parks today by submitting an application.

Note applications are opening soon.

### **Overview of the Southern Plain Agricultural Development Opportunity:**

The Southern Plain Agricultural Development Project, a government initiative, focuses on the development of agricultural land in two key areas: Amity Hall / Bridge Pen in St. Catherine and Parnassus in Clarendon. Covering 795 hectares, the project encompasses six major components, including infrastructure works, engineering, construction-related services, and project management. Funding for the project comes from the Caribbean Infrastructure Development Fund (CDB)/ United Kingdom Caribbean Infrastructure Development Fund (UKCIF), with additional support from the Government of Jamaica.

The Southern Plains Agricultural Development (SPAD) project holds great promise for Clarendon and St. Catherine parishes. The 795 hectares, formerly sugarcane lands, will be repurposed and made available for cultivating diverse crops such as Mango, Avocado, Tomatoes, Sweet Potato, Irish, and more, upon project completion.

Recognizing the crucial role of proper land and soil preparation in successful crop and livestock production, the SPAD project addresses the challenges faced by agri-business investors involved in the raw production phase of the value chain. Many investors lack the necessary infrastructure, machinery, and equipment. To tackle this, the initiative facilitates affordable access to these resources in and around the SPAD area. The primary objective is to bolster agricultural productivity, stimulate economic activity, and uplift the local farming community.

By embracing the Southern Plain Agricultural Development Project, investors have the opportunity to capitalize on the untapped potential of repurposed land and contribute to the growth of sustainable agriculture in the region. The project's strategic planning and government backing ensure a conducive environment for agricultural ventures to thrive, making it an attractive prospect for prospective investors seeking long-term returns and positive community impact.

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## LIST OF ACRONYMS

AGRO-INVEST – Agro-Investment Corporation  
AMID – Agricultural Marketing Information Division  
CARDI – Caribbean Agricultural Research and Development Institute  
GOJ – Government of Jamaica  
ITC – International Trade Center  
JMD – Jamaican Dollars  
MICAF – Ministry of Industry, Commerce, Agriculture and Fisheries  
NIC – National Irrigation Commission  
RADA – Rural Agricultural Development Authority  
STATIN - Statistical Institute of Jamaica  
UK - United Kingdom  
USA/US - United States of America  
USD - United States Dollars  
USDA - United States Department of Agriculture

## Executive Summary

<b>Farm Size:</b>	5 acres (2 hectares)
<b>Project Description:</b>	<p>The project is seeking to establish a 5-acre Sweet Corn.</p> <p>The average annual net profits over a ten (10) year period are projected to be approximately J\$28,777,686.91</p> <p>The accumulated ten (10) year net profit is projected to be approximately J\$47.3.</p> <p>Capital Investment Cost: J\$4.2M.</p>
<b>Project Sector</b>	Agriculture: Crop Production of Sweet Corn
<b>Financial and Economic Analysis and Recommendation</b>	<p><b>Internal Rate of Return: 553%</b> (at normal investment assumptions over a period of 10 years).</p> <p><b>Net Present Value: J\$164M</b> (at normal investment assumptions over a 10-year period).</p> <p>Based on the outcomes of the analysis, the project is considered to be viable.</p>

## Product Profile

Scotch Bonnet (Yellow) Pepper



Sweet Corn



Processes sweet corn

**Botanical Name and Origin:** Sweet corn (*Zea mays conva. Saccharata* var. *rugosa*), otherwise known as pole corn or sugar corn) is a variety of the Maize family having a raised content of sugar.

Sweet corn occurs as a spontaneous mutation in field corn and was grown by several Native American tribes. The cultivation occurred when the Iroquois tribes grew the first recorded sweet corn for European settlers in 1779.

**Species:** there are 5 species of sweet corn: Standard Sugary, Sugary Enhanced, Supersweets, Synergistic, Augmented Supersweets.

**Health Benefits:**

It aids digestion, it can decrease the risk of heart disease, strokes, type 2 diabetes and bowel cancer.

Sweetcorn is rich in folate as well, also known as vitamin B9.

Also found in sweetcorn is another B vitamin: thiamine (vitamin B1).

Corn is also a good source of vitamin C

**Nutritional Value:**

Sodium

Potassium

Dietary fiber

Sugar

Protein

Vitamin C

Iron

Vitamin B6

Magnesium

## Agronomics

### Genetic Types of Sweet Corn

There are five main types of sweet corn available. These types vary in sugar content, texture, length of harvest period, storage life, and seed vigor/germination requirements. The five main types of sweet corn are standard sugary (su), sugary enhanced (se), shrunken 2 (sh2), synergistic (syn), and augmented supersweets (shA). To help in cultivar selection, the characteristics of the five types of sweet corn are described below:

- **Standard Sugary (su)** - Standard sugary cultivars have been grown for many years. These cultivars have the traditional sweet corn flavor and texture. Sugar levels are generally between 10 and 15 percent at harvest. Unfortunately, ears of sugary cultivars retain their high quality for only 1 or 2 days. Also, standard sweet corn cultivars don't store well as sugars quickly convert to starch after harvest. Seeds germinate well at soil temperatures of 55 to 60°F.
- **Sugary Enhanced (se)** - Sugary enhanced cultivars contain the *sugary enhancer (se)* gene that produces ears with sweet, tender kernels. Sugar levels are slightly higher than standard sugary cultivars. The harvest and storage life of se types are slightly longer than standard sweet corn. Seeds germinate well at soil temperature of 55 to 60°F.
- **Shrunken 2 (sh2) or Supersweets** - These cultivars contain the *shrunken-2 (sh2)* gene. The common name is derived from the shrunken or wrinkled appearance of the dried kernels. Shrunken-2 cultivars have very high sugar levels. They also convert sugar to starch slowly allowing for a longer harvest period and storage life. The seedcoats on kernels are rather thick, giving the corn a firmer, crunchy texture. Soil temperatures need to be at least 60°F for optimal germination.
- **Synergistic (syn)** - Synergistic sweet corn cultivars possess *su*, *se*, and *sh2* genes. Synergistic cultivars are sweet, creamy, and tender. They have an excellent storage life. Seeds germinate well at soil temperature of 55 to 60°F.
- **Augmented supersweets** - are an improved type of shrunken sweet corn as they contain the *se* gene. They are sweet, tender, and have a long storage life. Soil temperatures should be at least 60°F for optimal germination.

### ENVIRONMENTAL CONDITIONS

#### Temperature

Optimum growth of sweet corn occurs when temperatures range from 75 to 86 F. High night temperatures are detrimental since they result in increased respiration rates and loss of photoassimilates. Growth will not occur when temperatures are below 50 F.

#### Water

For satisfactory growth and high yields, sweet corn requires a continuous supply of moisture. In most oases this is the equivalent of 18 to 28 in. of water to produce a crop. Seed will germinate in soils with moisture ranging from slightly above the permanent wilting percentage to field capacity. The most critical growth periods that require adequate soil moisture are during germination and stand establishment, tasseling and silking, and ear fill. Depending upon local environmental conditions, a minimum of 1 to 1.5 in. of water per week is required to insure pollination and ear fill.

#### Planting

Sweet corn production is based on continuous harvest in both fresh market and processing areas. Since the time between planting and harvest depends primarily upon temperatures, preseason planting schedules are generally based on the use of heat units (degree days). The number of degree days required by different varieties to reach maturity is generally determined by the seed companies developing the seed. In production planning, planting schedules are

developed by using historical daily heat unit values (using a base of 50 F). After planting begins, planting schedules are modified based on actual heat unit accumulation. Using this method, it is possible to schedule harvest throughout the harvest season and take into account differences in varieties, actual growing conditions, and variation in demand during the harvest season. Other considerations in establishing planting and harvesting schedules are cultivar differences, day length, cloudiness, rainfall, and the fact that ears on the stalk remain in good marketable condition somewhat longer during cool weather than during warm weather.

### **Seed and Seed Quality**

Precision seeding for the desired plant spacing can assure uniform stand establishment and plant growth as well as reduce the seed use per acre. Prior to seeding, fields should be leveled to eliminate low, wet areas that cause poor stands and plant growth. Treated seed should be used for protection from soil-borne diseases and insects during germination and seedling development. This measure is particularly important for seeds with the *sh2* gene (and all super sweet types) since they tend to germinate slower and produce weaker seedlings.

Seed should have high germination (90%) and vigor and be separated by size (large and small) and shape flat or round). Uniform seeds are especially useful with precision seeding equipment. Large seeds frequently produce more vigorous plants and uniform stands than small seeds. Seeds of the super sweet types, and particularly those with the *sh2* gene, are very small, fragile (easily damaged in handling and planting), and germinate poorly in cold soils.

### **Plant Spacing**

Highest yields result from rows 28 to 32 in. apart and seeds spaced 8 to 7 in. in the row to give a stand of about 24,000 plants per acre. For larger ears, wider rows (36 in.) with seeds spaced 7.5 to 6.5 in. (20,000 to 23,000 plants per acre) can be used. A minimum row spacing of 30 in. is recommended for mechanical harvesting.

### **Ear Uniformity and Number Per Stalk**

Uniform seedling emergence and stalk growth are essential for ears of uniform maturity at a single harvest. If there is more than one ear per plant, the range in maturity and ear size requires extensive sorting before packing. A much smaller range in maturity and ear size results from cultivars and plant spacing that produce only one ear per stalk.

### **Mineral Nutrition**

Sweet corn requires a well-drained soil with adequate water holding capacity for optimum growth. Light, sandy soils will require irrigation to meet crop water demands and heavy, clay soils may need to be tilled to improve drainage conditions. Sweet corn grows best in soil with a pH between 5.8 and 6.5. Lime should be applied according to soil test recommendations if the pH falls below 5.8.

Efficient fertilizer use for sweet corn should be based on a soil testing program and selection of realistic yield goals. Tissue analysis can also be used to provide supplemental information on the fertilizer program and the nutritional status of the plant.

Soil tests prior to planting provide the best information for determining whether sweet corn will respond to applied fertilizer. Instructions for taking a soil sample can be obtained through the New Port Fersan or Agricultural Land Management Division. Because nitrogen can move rapidly and fluctuate widely in many soils, the nitrogen soil test is not usually reliable and is used in only a few areas of the country for determining crop nitrogen requirements. The nitrogen soil test can be used for predicting fertilizer needs in areas with low rainfall where nitrogen loss is not a problem. Soil test interpretations will vary with extractant used and region of the country.

Tissue analysis can be used during the growing season to monitor the nutrient status of the plant.

## **Nitrogen**

Nitrogen fertilizer recommendations for sweet corn are based on yield goal and previous crop. Nitrogen management is not only important from a crop production standpoint, but also from an environmental standpoint. On sandy soils, nitrogen can leach out of the root zone with heavy rainfall or excessive irrigation. As a consequence, the potential for nitrate contamination of the ground water increases and nitrogen deficiency may result. On sandy irrigated soils, nitrogen should be split applied: one third to one half the nitrogen requirement at planting, and the remainder applied as one or two side dress applications at the 6 and/or 12 leaf stage. On relatively heavy soils or non-irrigated soils that do not receive leaching rains, nitrogen incorporated prior to planting is usually sufficient to meet sweet corn needs. Avoid excessive nitrogen applications as some of the nitrogen not taken up by the crop may contribute to ground water problems. Nitrogen rate can be lowered if the crop follows a legume or if manure is used. Although nitrogen content of manure varies, nitrogen fertilizer rates can be lowered by about 5 lb. N/a. for each ton of cow manure applied. Poultry manure supplies about twice this amount. Symptoms of nitrogen deficiency include stunted growth, yellowing of the older leaves and poor yields.

## **Phosphorus and Potassium**

Soil tests should be used to determine whether phosphorus or potassium fertilizers are needed. If soil tests are in the high range, only banded applications at low rates (15 lb.  $P_2O_5$  /a., 15 lb.  $K_2O$ /a.) at planting would be required. Root growth of young sweet corn seedlings is enhanced in cool soils with banded phosphorus applications. As soil temperatures increase, phosphorus becomes more available, and response is not as likely. Potassium can leach in sandy soils low in organic matter. Broadcast applications of phosphorus and potassium are necessary when soil test levels are in the low range. Symptoms of phosphorus deficiency are stunted growth and a dark green or purpling of the older leaves. Potassium deficiency symptoms include scorching of the margins of the older leaves.

## **Micronutrients**

Micronutrients which include boron, chlorine, copper, iron, manganese, molybdenum, and zinc are required in lower amounts than the other essential nutrients. Generally, soils contain sufficient levels of micronutrients to meet crop demands; however, in some area, micronutrient shortages occur and may limit yields. Sweet corn has a relatively high demand for zinc. Deficiency of zinc may occur in high pH soils (greater than 7.0), sandy soils, and soils containing high phosphorus levels. If soil test zinc is low, then banded applications at planting (2 to 3 lb. Zn/a.) should be applied. Zinc deficiency symptoms include stripping of the younger leaves and shortened internodes. The need for other micronutrients should be confirmed by soil tests and/or tissue analysis.

## **Weeds**

Weeds reduce the yield and quality of sweet corn by direct competition for light, water, and nutrients in the soil. Weeds may also harbor insects, diseases and pests that attack corn. Historically, the major reason for corn being grown in wide rows was weed control. Row width was dictated by the size widths of horses needed to pass between the rows pulling a cultivator.

At the present time, a wide selection of herbicides is available that effectively control most weeds. Herbicide treatments are primarily categorized on the basis of the time of application: pre- planting, preemergence, and postemergence. Pre-planting treatments are applied either before the corn is planted and as a surface treatment or incorporated into the soil. Preemergence application takes place after the corn is seeded but before emergence of the corn or weeds. Preplant and preemergence herbicides, properly selected and applied, prevent weed competition during emergence and early seedling growth. Postemergence applications take place after the emergence of both the corn and weeds. These are most effective when weeds are small.

## **INSECTS**

Insects can severely damage all portions and ages of sweet corn plants. More than 50 insect species or groups of species are known to cause economic losses to sweet corn in the U.S. Soil insects have been considered the most important pest grouping which consistently causes damage to all types of corn. Some common insects that will affect the growing of sweet corn are soil pests, foliar insects, corn earworm, aphids and stem borers.

### **Other foliar insects**

In addition to the above insects, leaf and flea beetles attack sweet corn foliage. Economic damage is caused by thrips, chinch bugs, and the corn leaf miner. Although not an insect, the spider mites have been identified as causing serious problems in several areas of the U.S. Of these, the grass mite, the two spotted spider mite, and the red spider mite are important.

### **Diseases**

Sweet corn is susceptible to the parasitic diseases common to dent corn. All parts of the plant are susceptible to a number of diseases which may reduce yield and quality of the sweet corn. The extent and severity of a disease depends on the presence of a pathogen (disease causing organism), the susceptibility of the sweet corn cultivar, and the right environment (rain, temperature, etc.) for the pathogen to develop. Some diseases are not of widespread economic importance because they occur rarely or only in localized areas. Others can be widespread, and if conditions are favorable, may cause significant economic damage. A good reference for corn disease identification is *A Compendium of Corn Diseases* published by the American Phytopathological Society, Inc.

## **HARVESTING AND HANDLING**

### **Maturity and Quality**

When harvested at optimum maturity, the silks are brown and dry, the kernels are plump, sweet, milky, tender, and almost maximum size. Sweet corn has a short harvest period, and harvesting on the day of optimum maturity is very important for good quality and yield. Immature ears have smaller diameters, and the kernels are less developed, watery, and less sweet. With very little change in husk appearance, kernels will pass the period of maximum sweetness and start to dent.

### **Harvesting Practices**

Single harvests by hand or machine are practiced by commercial growers. Trucks or tractor drawn wagons haul the ears to an assembly area in the field, packinghouse, or processing plant for grading, packing, or processing. Harvesting methods differ due to availability of suitable labor, equipment, and destination of the corn. Processing sweet corn is all mechanically harvested and hauled bulk to the processing plant.

Self-propelled packing houses (mule trains) with conveyers for hand-harvested ears are still used to a degree in corn for the fresh market. With hand harvesting, there is some selection for marketable ears. Machines harvest all ears, culls, and trash included. Recent improvements in harvesting machinery allow shank trimming and reduction in ear damage. Removal of long shanks and flags is important for fresh market sales to prevent water loss during transportation. Fresh market corn is usually packed in wire bound crates or corrugated cartons containing five dozen ears.

## Grading

Commercial fresh market growers ship U.S. Fancy (or a percentage of U.S. Fancy grade) which require a minimum cob length of 6 in. and freedom from injury by worms or other causes. Wide ranges in ear length and diameter result from differences in production areas, season, and variety.

Retailers of fresh market corn object to a wide range in number of ears per crate. because they purchase by the crate and sell by ear count. A uniform number of ears per crate is highly desirable. Defects of most concern are worm and mechanical damage, or perhaps poor cob fill.

## Precooling

Sweet corn that is not consumed or processed within a few hours after harvest should be precooled without delay to reduce conversion of sugar to starch and loss of flavor and tenderness. Hydrocooling is the most common precooling method. Palletized corn, either loose or in crates, are conveyed through a shower of 31 F to 34 F water or placed in a batch hydrocooler for a sufficient time (approximately 45 minutes) to achieve cooling. In some cases, corn is placed in a cold room beneath nozzles which spray cold water over the bins or crates. Hydrocooling can be effectively used to lower center cob temperatures to the desired 40 F, if water temperature is kept low, the water has maximum surface contact with the corn and sufficient time is allowed. Some shippers of fresh market corn also put ice in the carton after cooling and packing to ensure that corn remains cold in transit.

Vacuum cooling can be more rapid, but if the ears are not kept wet, a 1% moisture loss for each 10-degree drop in corn temperature occurs. Following precooling, sweet corn should be refrigerated at 32 F and marketed or processed as rapidly as possible.

## Companion Planting

Below is a list of plant types that are compatible with sweet corn:

- **Vines** - Vine plants provide shade to keep the roots of the corn plants moist and also serve as a natural weed suppressant. Similar to squash, cucumber vines grow well near corn. The vines can also help deter raccoons.
- **Melons** - are in the same family as squash and cucumbers and can be used in place of winter squash in a 3 sister's arrangement. The long vines will offer the same protection and living mulch as squash does.
- **Beans/Peas** - fixes nitrogen in the soil, making it a perfect corn companion plant. Peas are planted as early as possible in spring, while corn is not planted until the soil is warm. Plant corn seeds directly in the pea patch to glean their nitrogen and save space.
- **Dill** - is a great herb to grow near corn. It can improve the flavor of corn and it will attract beneficial insects such as lady bugs and parasitic wasps.
- **Marigolds and Nasturtiums** - These two flowers are a must in all gardens because of their ability to repel or trap pests. They repel aphids, including corn aphids and other pests, as well as attracting beneficial bugs.
- **Annual flowers** - are often overlooked in a vegetable garden, but they are more than just beautiful. Flowers will attract beneficial insects such as green lacewings and parasitic wasps, which will help the sweet corn to fight against pests. Cosmos and zinnias are two easy-to-grow examples.
- **Borage** - can help repel worms that attack corn plants. Borage also attracts beneficial insects such as lady bugs to the sweet corn farm.
- **Summer Savory** - is another herb that helps repel pests and attract beneficial bugs.
- **Thyme** - helps repel the corn earworm.
- **Aromatic Plants** - such as lavender, mint, oregano, dill, garlic, marigolds, basil and sage help deter deer.

### **What NOT to Plant with Corn**

Below are plants that should be planted in another area of the garden from sweet corn:

- **Tomatoes** - share common enemies with corn. Grown near each other, they will attract both the corn earworm and the tomato hornworm. Also, both corn and tomatoes are heavy feeders and will compete for nutrients in the soil.
- **Brassicas** - All members of the cabbage family including broccoli, Brussels sprouts, kale, cauliflower should be planted apart from corn. Corn shades the brassicas too much, stunting their growth. As well as both crops are also heavy feeders and will compete for nutrients in the soil.

## SWOT Analysis for the Establishment of a 5-Acre Sweet Corn Farm

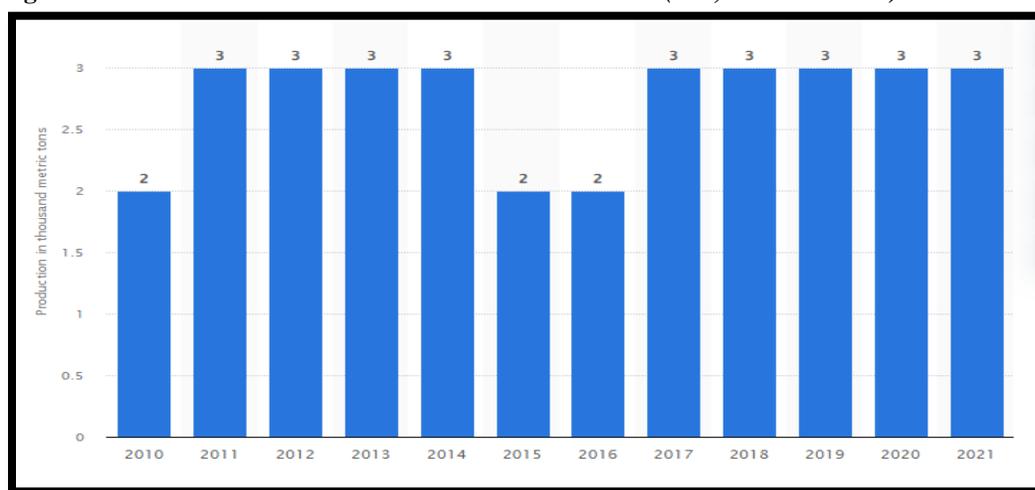
<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• <b>Climate:</b> Jamaica's tropical climate with warm temperatures and consistent sunlight provides favorable conditions for sweet corn cultivation.</li> <li>• <b>Soil Quality:</b> The country has a variety of fertile soils suitable for sweet corn farming, especially in regions with well-draining loamy soils.</li> <li>• <b>Water Resources:</b> Jamaica generally has abundant rainfall, which can meet the water requirements of sweet corn crops, reducing the need for extensive irrigation.</li> <li>• <b>Local Demand:</b> Sweet corn is a popular vegetable in Jamaica, with high demand in both local markets and the tourism industry.</li> <li>• <b>Export Potential:</b> Jamaica's proximity to international markets presents opportunities for sweet corn export, especially during periods of high demand in export destinations.</li> <li>• <b>Internal rates of return</b> up to 553% over a 10-year period for sweet pepper farming.</li> <li>• <b>High demand</b> for sweet corn all year-round.</li> <li>• <b>Access to experts and good networks</b> (RADA, Agro-Invest and JAMPRO).</li> <li>• <b>Available markets</b> to sell produce such as agro-processing, municipal markets, restaurants and hotels.</li> </ul>	<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• <b>Crop Diversification:</b> Sweet corn cultivation can be a valuable addition to diversify agricultural production in Jamaica.</li> <li>• <b>Value-Added Products:</b> Exploring value-added products like frozen or canned sweet corn can create additional revenue streams and cater to different market segments.</li> <li>• <b>Organic and Sustainable Farming:</b> Growing sweet corn using organic and sustainable farming practices can tap into the growing demand for eco-friendly products.</li> <li>• <b>Tourism Market:</b> Sweet corn's popularity among tourists presents an opportunity for local farmers to supply resorts, hotels, and restaurants.</li> <li>• <b>Access to production information/ technologies</b> as a result of research and development work conducted by local, regional and international agencies.</li> <li>• <b>High export potential</b> (diaspora)</li> <li>• <b>Access to the services</b> of the Praedial Larceny Unit at MICAF.</li> <li>• <b>Intercropping</b> with other cash crops is practiced.</li> </ul>
<p><b>Weakness</b></p> <ul style="list-style-type: none"> <li>• <b>Pest and Disease Pressure:</b> Sweet corn can be susceptible to pests and diseases, and without proper pest management practices, it may lead to yield losses.</li> <li>• <b>Labor Costs:</b> Labor-intensive tasks, such as planting and harvesting sweet corn, can lead to higher production costs.</li> <li>• <b>Post-Harvest Losses:</b> Due to the perishable nature of sweet corn, inadequate post-harvest handling and storage facilities could lead to losses.</li> <li>• <b>Infrastructure:</b> Some regions in Jamaica may lack sufficient agricultural infrastructure, such as transportation and storage facilities, which can affect the overall supply chain efficiency.</li> <li>• <b>Short life span</b> of mature fruit.</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• <b>Competition:</b> Sweet corn faces competition from other vegetables and imported products, which can affect local market prices.</li> <li>• <b>Climate Change:</b> Changes in weather patterns and extreme weather events could impact sweet corn yields and quality.</li> <li>• <b>Imported Products:</b> Reliance on imported sweet corn may pose a threat to local producers, especially during periods of lower local production.</li> <li>• <b>Natural disasters.</b></li> <li>• <b>Praedial larceny.</b></li> <li>• <b>Sweet Corn</b> is also susceptible to several diseases and pests.</li> </ul>

## Market Analysis

Sweet corn is a naturally occurring variety of maize that is also known as pole corn or sugar corn due to its high sugar content as compared to other varieties of corn. Sweet corn is often harvested when immature and should be consumed fresh before the sugar inside the endosperm of the corn kernels becomes starchy and tough. Sweet Corn can be processed and canned, served as corn-on-the-cob or frozen corn. This corn is bred for its plump, juicy kernels that include higher levels of natural sugars and a sweet flavour.

Sweet corn is a popular crop grown in Jamaica. According to Statista, the production of corn in Jamaica has remained more or less stable in recent years. In 2020, production amounted to three thousand metric tons, same figure registered in the two preceding years. This figure remained the same in 2021.

**Figure 1: Production of corn in Jamaica from 2010 to 2021 (in 1,000 metric tons)**



Statista, 2022

The popularity of sweet corn has increased drastically in the past couple of decades, owing to a rising focus on health and nutrition around the world. The growing use of sweet corn in the food processing industry has also aided in the market expansion and is projected to bolster sales of sweet corn seeds in the future as well. High use of sweet corn in animal feed production is also anticipated to boost sweet corn seed demand over the coming years. According to FactMr, the global sweet corn seeds market stands at a valuation of US\$820.3 M in 2023 and is forecasted to expand at 3.8% growth rate (CAGR) to reach US\$1.19B by the end of 2033.

The harmonized system code for sweet corn is 07104000. According to ICT, the US is the leading producer of sweet corn and has an export market valued at \$US92.8M in the year 2022. Jamaica is also an importer of the US's sweet corn. The value of Jamaica's import is \$US1M.

When Jamaica produces sweet corn and enters the export market, the sweet corn is only exported to Grenada and is valued at \$US7,000. It must be noted, also according to the ITC data, Jamaica has a negative trade balance of - \$US1.4M as it applies to sweet corn as sweet corn is imported in greater volume than it is exported. See *Figure 3* below.

**Table 1:** Export of Jamaica's Sweet Corn

Importers	Value exported in 2022 (USD thousand)	Trade balance 2022 (USD thousand)	Share in Jamaica's exports (%)	Quantity exported in 2022	Quantity unit	Unit value (USD/unit)	Growth in exported value between 2018-2022 (% p.a.)
Total	7	-1,451	100	1	Tons	7,000	41
<a href="#">Grenada</a>	7	7	100	1	Tons	7,000	42
<a href="#">India</a>		-165					
<a href="#">Belgium</a>		-236					
<a href="#">United States of America</a>		-1,057					

ITC, 2022

Jamaica faces competition from other countries that also produce sweet corn. The major competitors in the market include the United States, China, and Thailand. These countries have established supply chains and distribution networks that give them an advantage over Jamaica. To increase its market share, Jamaica needs to focus on improving its supply chain and distribution networks. The country should also invest in marketing campaigns that promote Jamaican sweet corn as a premium product with a unique taste and texture. By doing so, Jamaica can differentiate itself from its competitors and capture a larger share of the global sweet corn market.

#### **Jamaica Sweetcorn Export and Export Prices - Historical, Trends and Prediction**

According to Selina Wamucii, the export price of sweetcorn from Jamaica over the last five years has been relatively stable. In 2013 and 2014, the price was 2.00 US\$ per kg. In 2016, the price dropped to 1.00 US\$ per kg, before increasing to 2.50 US\$ per kg in 2017. The price then dropped back to 1.00 US\$ per kg in 2018. Based on this data, it is likely that the export price of sweetcorn from Jamaica will remain at 1.00 US\$ per kg in 2023 and 2024.

The import price per kilogram of Sweetcorn into Jamaica over the last five years has been relatively stable. In 2013 and 2014, the price was \$2.00 per kg. This dropped to \$1.00 per kg in 2016, before increasing to \$2.50 per kg in 2017. The price then dropped back to \$1.00 per kg in 2018. Based on this data, it is likely that the import price of Sweetcorn into Jamaica will remain relatively stable in the coming years. We can predict that the import price of Sweetcorn into Jamaica in 2023 and 2024 will be around \$1.00 per kg.

In 2019, Jamaica shipped 0 tonnes of sweetcorn. For 2019 alone, the market for Jamaica sweetcorn (fruits category) has changed by 0% compared to the year 2018. Between 2017 and 2019, sweetcorn's exports went down by -100% netting the Jamaica US\$0.00 in revenue for the year 2019.

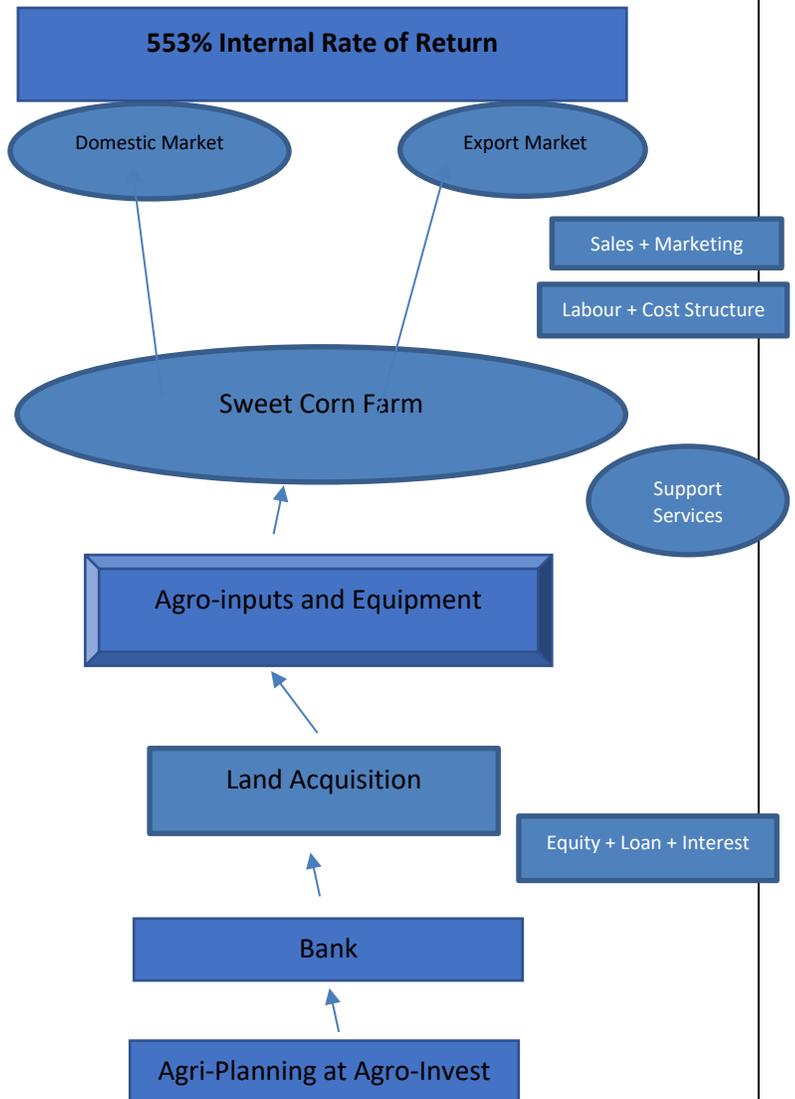
## Business Model and Financial Analysis for Investment in Sweet Corn Farming

### INVESTMENT OPPORTUNITY

#### *Opportunity for Investment in Sweet Corn Farming*

- **J\$4.2M investment opportunity for a 5 acre Sweet Corn Farm.**
- **Sell produce** to domestic buyers, agro-processors and exporters for local and international markets.
- Requires investments in **drip irrigation infrastructure and equipment.**
- Estimates were calculated based on 60% equity financing and 40% loan financing at an interest rate of 10%.
- The estimates are made for a 5-acre area of production.
- Land rate utilized is J\$15,000 per acre per annum.

### BUSINESS MODEL



## FINANCIALS

### **Investment Cost**

The initial investment is estimated at **J\$4.2M**.

The average yield is 2420 dozen per acre and the average cost of production is J\$350.00/doz.

### **Revenue Projection**

Average revenue for the ten years is expected to amount to J\$33.4M.

### **Return on Investment**

The estimated financials of the project are promising and show an **Internal Rate of Return (IRR) of 553% and Net Present Value (NPV) of J\$164M** when future cash flows were discounted utilizing a rate of 10% percent based on the going bank lending rate.

### **Assumptions:**

- Access to NIC Pump;
- Irrigation costs included;
- Does not include costs for a water pump.

## BUSINESS MODEL

<p><b>KEY PARTNERS</b></p> <ul style="list-style-type: none"> <li>• Agro-Invest - (Business Plan)</li> <li>• Financial Institutions</li> <li>• MoAF (R&amp;D)</li> <li>• RADA</li> <li>• Input suppliers</li> <li>• Farmers/investors</li> <li>• Supermarkets</li> <li>• New and small Agro-processing investors</li> </ul>	<p><b>KEY ACTIVITIES</b></p> <ul style="list-style-type: none"> <li>• R&amp; D</li> <li>• Capacity Development /Training</li> <li>• Marketing &amp; Sales</li> </ul>	<p><b>VALUE PROPOSITION</b></p> <ul style="list-style-type: none"> <li>• High Quality and convenient products</li> <li>• Freshness of produce</li> <li>• Employment</li> <li>• Contribution to Gross Domestic Product</li> <li>• Import Substitution</li> <li>• Value chain development</li> <li>• Reduction in post-harvest losses</li> </ul>	<p><b>CUSTOMER RELATIONS</b></p> <ul style="list-style-type: none"> <li>• Personal relations with customers</li> <li>• Building a reputation for reliability and quality</li> </ul>	<p><b>CUSTOMER SEGMENT</b></p> <ul style="list-style-type: none"> <li>• Business to Business (B2B)</li> <li>• Hotels</li> <li>• Supermarkets</li> <li>• Exporters</li> <li>• Agro-Processors</li> <li>• Wholesalers</li> </ul>
<p><b>COST STRUCTURE</b></p> <ul style="list-style-type: none"> <li>• Wages</li> <li>• Operating costs</li> <li>• Infrastructure development and maintenance</li> <li>• Machinery &amp; Equipment</li> <li>• Cost reduction via economy of scale</li> <li>• Land</li> <li>• Transportation</li> </ul>		<p><b>REVENUE STREAMS</b></p> <ul style="list-style-type: none"> <li>• Sweet Potato Sales (individuals and Businesses)</li> </ul>		

## **Agricultural Incentives and Support Services**

A 5-acre Sweet Corn farm 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 Inputs Relief (PIR) benefit requires that the Commissioner of Customs be satisfied that the items imported are to be used in primary production/approved farming activity. The 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.

### ***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”.

## Appendix 1: Cost of Production for a 5 Sweet Corn Farm

Labour Operations	Unit	No. of Units	Cost/Unit	Total Cost
<b>Land Prep</b>				
Land Clearing	MD	16.67	3000	50,000
Ploughing	Tractor	1	20000	20,000
Furrowing	Tractor	1	10000	10,000
				<b>80,000</b>
Irrigation Installation	MD	3	3000	9,000
Planting	MD	6	3000	18,000
Pesticide Application	MD	8	3000	24,000
Weed Control	MD	10	3000	30,000
Moulding	MD	10	3000	30,000
Fertilizer Application	MD	4	3000	12,000
Harvesting	Job	1	30000	30,000
<b>Lunch</b>		51.66667	500	25,833
<b>SUBTOTAL</b>				<b>178,833</b>
Total Labour				<b>258,833</b>

### Material Inputs

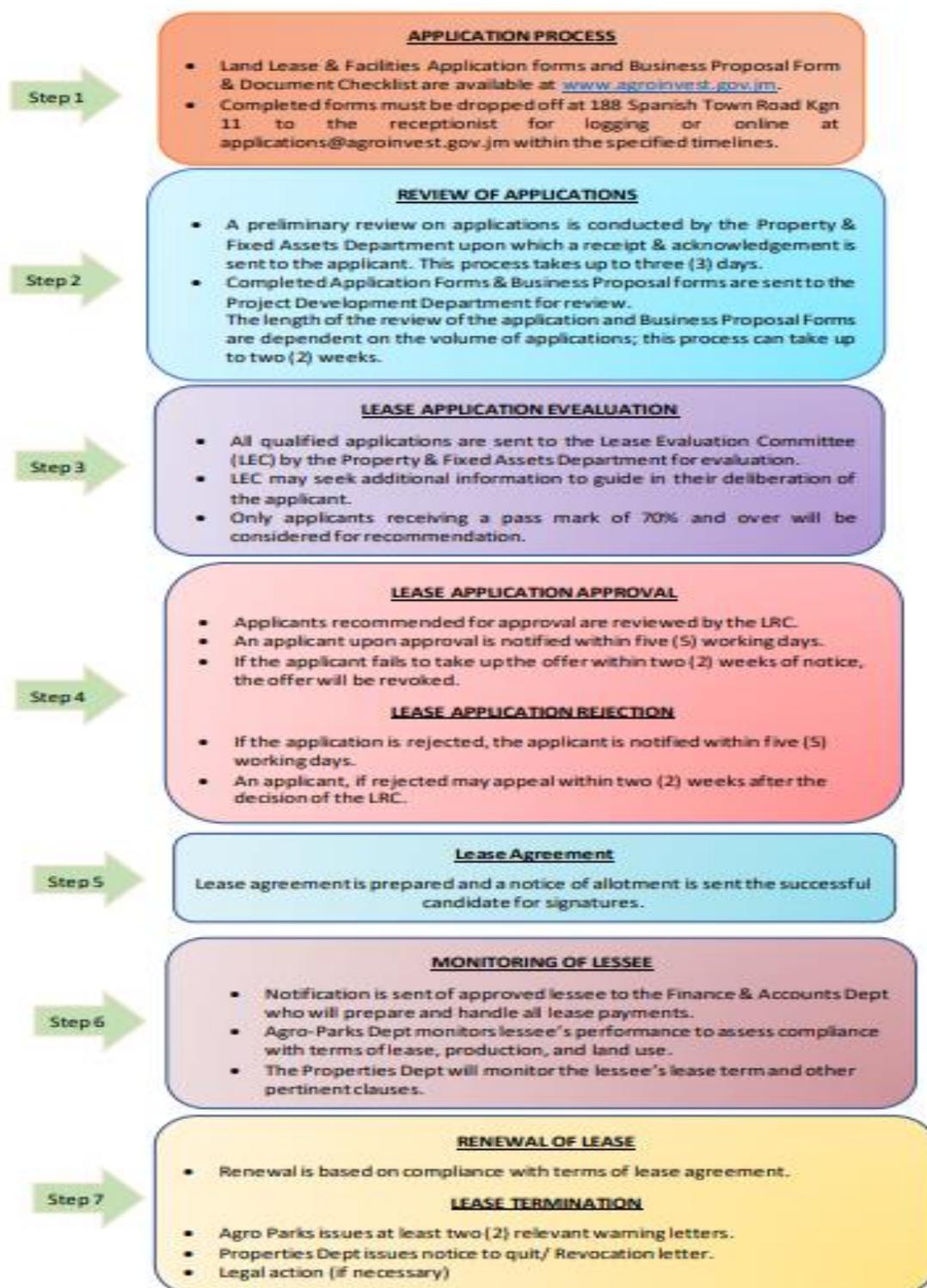
Planting Material	Pack (kg)	2	7500	15,000
Water	monthly	3	4000	12,000
<b>Fertiliser:</b>				
NPK 11-22-22	50 kg	3	10110	30,330
Potash	50 kg	4	6750	27,000
<b>Insecticide</b>				
Match	100 ml	4	3700	14,800
Tracer	120 ml	7	3300	23,100
Indox	120 ml	5	4000	20,000
<b>Herbicide:</b>				
Dual Gold	Litre	1	6000	6,000
Glyphosate	Litre	1	1300	1,300
<b>SUBTOTAL</b>				<b>149,530</b>

### Other Costs

Transportation (10 per cent of material)		14,953
**Tools depreciated (5 years)		60,000
Irrigation		300,000
Land Charges per crop cycle		15,000
Supervision (15 percent of labour and material)		49,255

SUBTOTAL		439,208
TOTAL OPERATING EXPENDITURE PER CROP CYCLE		847,571

## Appendix 2: How to Apply



### Appendix 3: LIST OF INPUT SUPPLIERS

COMPANY	DESCRIPTION	CONTACT
<b>Isratech Waterworks</b>	Manufactures and supplies water infrastructure products and systems. Waterworks solutions, water, and wastewater treatment.	2 Kendal, P.O. Box 37, Shooters Hill, Mandeville, (876) 603-3564 <a href="mailto:info@isratech.com">info@isratech.com</a>
<b>Nutramix</b>	Livestock feed for local and regional farmers in dairy, poultry, pig, and horse.	Newport Mills Ltd. Myers Wharf, Newport East, Kingston 15, (876) 922-2606 <a href="mailto:sales@the-big-feed.com">sales@the-big-feed.com</a>
<b>Hi-Pro Jamaica</b>	Hi-Pro family of brands serves and offers farming supplies, broilers, layer birds, feed, home gardeners, and hardware supplies.	White Marl, St. Catherine (876) 984-7919-20
<b>Agro Grace Jamaica Limited</b>	Offers retail sale of farm supplies and equipment, feedings, and fertilizers.	697 Spanish Town Road Kingston 11 876-308-0165, 888-429-5465
<b>Newport Fersan Jamaica Limited</b>	Local supplier of blended inorganic fertilizers.	2A/2B Wherry Wharf Complex, 15 Newport E, Kingston (876) 967-5815
<b>Central Agricultural Supplies Company Limited (CASCO)</b>	Distributes feeds, fertilizers, agricultural chemicals, and equipment.	6 Ward Avenue Mandeville, Manchester (876) 962-3084/9719
<b>Ag-Chem Plants Limited Agricultural Chemicals Plant (AGCHEM)</b>	Formulates and distributes a wide range of pesticides for the agri-industry and home use.	AG-Chem Plant Ltd 2 East Ashenheim Rd. Kingston 11 (876) 757-0022
<b>St. Jago Farm Supplies</b>	Farm supplies and equipment, feedings, and fertilizers	Wellington Street Spanish Town, St. Catherine (876) 612-7825
<b>T. Geddes Grant</b>	Agricultural and veterinary products, including fertilizers and pesticides, and vegetable seeds.	109 Marcus Garvey Drive Kingston (876) 923-7311
<b>Evergrow Garden Centre</b>	Horticultural and farm supplies, garden tools, etc.	12 South Ave Kingston 10 (876) 906-9916

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

**AGRO-INVESTMENT CORPORATION**

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**Town Road Kingston 11**

**PO Box 144, Jamaica, West Indies**

**Telephone: 1 876 764 8071**

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