



AGRICULTURAL SPECIES CATALOG



GREENLAB
BIOTECHNOLOGY

The best of Nature
and Science

SUMMARY



WHO WE ARE

We are a private family foundation, committed since 2013 to reforestation and seedling production in general through the company **GREEN PEARL CORPORATION**.

Every year, we plant several hundred hectares of new trees native to the Panama area. Considering **the difficulty of obtaining very high quality plants** in large quantities, we decided to create our own production center, **GREENLAB BIOTECHNOLOGY**.

Our objective is twofold: to satisfy our own demand for seedlings aimed to be used in the reforestation in Panama, but also and principally **to satisfy the demand from new forestry and agricultural customers**, no matter their project and geographic location.

In partnership with the prestigious biotechnology laboratory of the University of Ghent (Belgium), GreenLab Biotechnology masters all the techniques and services required to produce high value-added plants, both *in-vitro* and in greenhouses.



THE GREENLAB PROJECT

CONTEXT

In agricultural production systems, plant pests and diseases remain a major source of losses. When not properly managed, they can jeopardize **up to 100% of the production**. Other challenges include increasing pest resistance to pesticides, rising temperatures due to climate change, and a shrinking availability of agrochemicals.

Today's market has evolved with new standards, favoring products that are predominantly organic and free from imperfections. All these factors, coupled with the limited development of vegetable production in Latin American countries, place local producers at a significant disadvantage.

The market today has evolved with new standards, which have led to a **preference for products that are essentially organic and free of imperfections in the fruit**. All these aspects, together with the scarce development of vegetable production in Latin American countries, **place local producers in a disadvantaged situation**.

WHAT TO DO

The solution lies in the technification of production. Countries like Iceland and the Netherlands have already adopted hydroponic greenhouse systems as the foundation of their agricultural output. Effective disease management in greenhouses is straightforward: begin with pathogen- and pest-free crops and ensure a sterile greenhouse environment. This approach maximizes the cost-efficiency of expensive installations while meeting high market standards and achieving superior yields.

Ironically, in many Latin American countries, accessing certified disease-free materials remains a challenge. Although cuttings from commercial plantations are commonly used as seeds, the primary issue persists: **if the mother plants are infected, the resulting plants will inevitably face phytosanitary problems**.



BIOTECHNOLOGY IS THE SOLUTION

Modern **plant biotechnology** procedures allow the micropropagation of selected materials and help **guarantee the quality and uniformity of newly developed plants** through the production of vitroplants.

A vitroplant is a plant produced under *in-vitro* conditions by plant tissue culture techniques, which are carried out in specific laboratories, **under strict sterile and controlled conditions**.



THEY TRUST US



SPECIES

Our agricultural catalog includes the following species. However, since its establishment, GreenLab Biotechnology has chosen to dedicate roughly **20% of its annual budget to research and development** of new species that we offer to the agricultural industry.

AVAILABLE PRODUCTS :

Blueberry (Vaccinium corymbosum)
Strawberry (Fragaria spp.)
Raspberry (Rubus idaeus)
Blackberry (Rubus fruticosus)
Arabic Coffee (Coffea arabica)
Robusta Coffee (Coffea canephora)
Cocoa (Theobroma cacao) (ex-vitro, grafted)
Banana (Musa acuminata)
Mango (Mangifera indica)
Plantain (Musa paradisiaca)
Papaya (Carica papaya)
Dragon Fruit (Hylocereus spp.)
Pineapple (Ananas comosus)
Yam (Dioscorea spp.)
Purple Yam (Xanthosoma sagittifolium)
Yautia or cocoyam (Xanthosoma violaceum)
Taro or dasheen (Colocasia esculenta)
Potato (Solanum tuberosum)
Cassava (Manihot esculenta)
Citrus (Citrus spp.)

UPCOMING PRODUCTS:

Avocado (Persea americana)
Pistachio nut (Pistacia vera)
Walnut (Juglans regia)
Almond (Prunus dulcis)
Hazelnut (Corylus avellana)

MICROPROPAGATION

Noun (botanical)

Micropropagation, or *in-vitro* culture, consists of choosing from within a species a specimen that presents particularly high qualities (strength, rapid growth, resistance to diseases and pathogens, robustness, drought resistance, etc...) and cloning it.

This is equivalent to multiplying the initial specimen from a plant fragment placed in a nutrient medium.

All plants resulting from this cloning will be identical, but above all, they will benefit from the same qualities as the initial specimen.



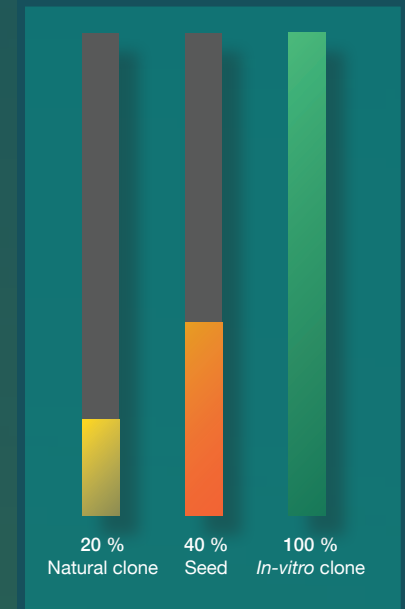
NATURAL CLONES, SEEDS AND IN-VITRO CLONES

"Natural clones" or cuttings should not be confused with *in-vitro* clones.

While both methods result in offspring with identical DNA to the parent material, this is where the similarity ends.

Natural cloning inherently introduces variations in genetic expression, degeneration, heterogeneity, stress, and other factors. Consequently, plants produced through natural cloning are often weaker than the parent plants, and with each multiplication cycle, the quality further declines.

In contrast, *in-vitro* cloning produces offspring that are genetically identical to the mother plant, ensuring that the quality remains consistent across generations.



MICROPROPAGATION STAGES

SELECTION

Identification of superb plants with desirable genetic characteristics to be maintained and propagated.



INITIATION

Plant tissues collected from the wild are disinfected and planted *in-vitro*, in a well-controlled environment.



ELONGATION

The *in-vitro* plant tissue begins its development which will allow new seedlings to be formed.



MULTIPLICATION

In-vitro seedlings are multiplied by sectioning plant tissues from them, creating new vitroplants.



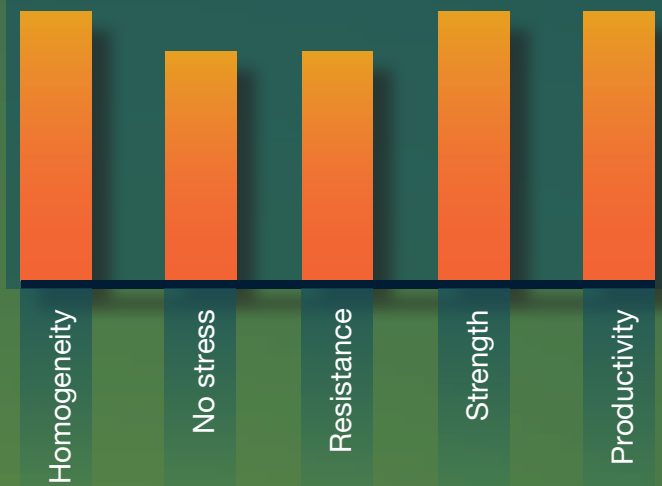
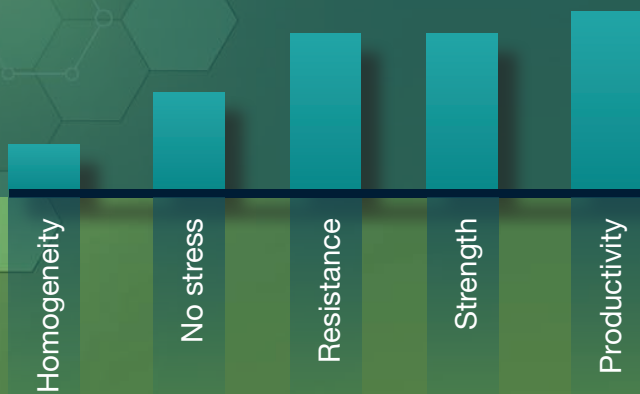


“Natural clones” and seeds

Micropropagation

The production of plants by seed is a simple technique, which has several disadvantages. The difficulty in obtaining seeds, the very short period of seed availability due to flowering and conservation problems are some of them.

Micropropagation is a more elaborate and entirely natural technique that almost eliminates all the disadvantages of growing from seed. In addition, the characteristics of the plants obtained are better and the quality is always maintained.



ROOTING

The culture medium of the plant is modified to induce root growth.



ACCLIMATATION

Under controlled conditions (such as light, temperature, humidity, and other factors), the plant will be prepared for the external environment.



GROWTH

The plant is taken to a conventional nursery to be monitored and grown up to the required size.



IN-VITRO CULTURE IS AN ALLY IN THE INTEGRATED MANAGEMENT OF PESTS AND DISEASES OF THE PITAHAYA CROP.

There are currently **17 genera and 25 species of plant pathogens** reported to infect pitahaya plants. Most cause fungal diseases of the stem, fruit and flowers. There are only two bacterial diseases, one viral and one nematode. Fruit and stem rot (*B. cactivora*), canker (*Neoscytalidium dimidiatum*), anthracnose (*Colletotrichum sp.*) and viral disease (*Cactus virus X*) are the most frequent diseases.

The use of **vitroplants as starting material for the establishment of new plantations eliminates this problem** by providing excellent phytosanitary quality. As vitroplants are produced under sterile conditions, **the presence of bacteria, fungi and nematodes is ruled out**, which cannot be guaranteed with plants obtained by traditional methods.

The cultivation of vitroplants in healthy fields and greenhouses allows a considerable **reduction in the use of pesticides, for a more economical and environmentally friendly production**. In addition, it has been demonstrated that the use of plants free of pathogens and diseases helps to obtain higher yields and better quality.

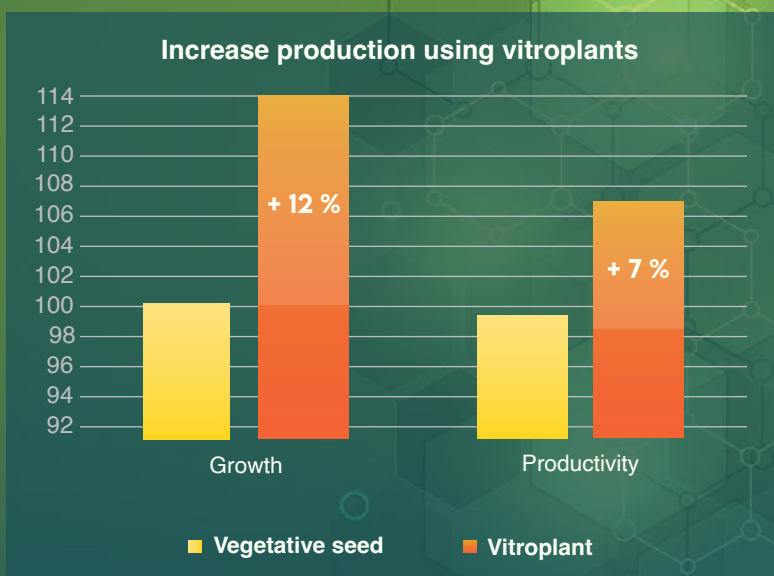


VITROPLANTS IMPROVE THE AGRONOMIC QUALITY OF THE PLANTATION AND PRODUCTION YIELDS.

Due to the cellular rejuvenation that occurs during in vitro culture, vitroplants are recognized for their **faster and more homogeneous development, as well as higher productivity** compared to plants produced by traditional cloning.

In many crops, the homogeneity of these materials induces a simplified organization of planting and a coordinated or predictable harvest, which helps in the mechanization of planting. This is why, for more than 50 years, **the propagation of plant species in laboratories and commercial greenhouses in different countries has proven to be a profitable alternative for growers**.

Since 1988, in a study carried out in Banano by J.W. Daniells and published in the Banana Newsletter magazine, it was proved that **vitroplants have a better performance in the field**, as they had a greater height (30 cm; 12%) compared to plants obtained by traditional methods. In addition, **these vitroplants generated a higher production by increasing by 7% the weight in fingers of the banana bunch and 12% more fingers per bunch**.



Vitroplants result in a **12%** increase in growth and boost productivity by at least **7%**.

BETTER RESULTS IN MANY SPECIES

More recent studies in different crops have confirmed these observations. In 2015 a team led by J. Vilchez compared the nursery growth of guava seedlings and vitroplants, demonstrating that **vitroplants outperformed seedlings in aspects such as dry matter accumulation, crop growth rate, relative growth rate, net assimilation rate, leaf area, number of leaves, and stem and root length.**

Similarly, in 2019 Franco Capocasa's team published a study in the journal *Plant Cell, Tissue and Organ Culture* comparing the nursery performance, field plant yield and fruit quality of in vitro and in vivo propagated strawberry mother plants. Their studies confirmed that **the use of micropropagation increases the sustainability of the production system in strawberry nurseries** due to cost optimization, reduction in prepropagation cycles and streamlined phytosanitary controls.

It has been demonstrated that this superiority of vitroplants can be extrapolated to diverse botanical groups and plants with different growth habits. In the research published by Felipe Jiménez-Terry and Daniel Agramonte in 2013, they analyze in vitro culture and macropropagation as a way of sustainability in the propagation of forest species, and detail how in mahogany micropropagation generates a reinvigoration effect in the material, which has an impact on better performance in the field. In addition, they summarize how the Institute of Plant Biotechnology developed a methodology for micropropagation of Eucalyptus clones, which demonstrated a **much higher growth dynamics of plants in vitro compared to those produced from seeds.**



GREENLAB'S PATENTED INEX[®] TECHNOLOGY IS UNIQUE IN OPTIMIZING THE TRANSPORT, RECEPTION AND ACCLIMATIZATION OF VITROPLANTS.

GreenLab's patented InEx[®] technology is unique in optimizing the transport, reception and acclimatization of vitroplants.

Rooted in vitro plants are often good material for commercialization, as they are miniaturized and in sterile conditions, **which optimizes transportation and facilitates phytosanitary procedures**. However, in order for a client to work with this type of plant, it will require adequate infrastructure, specific technical knowledge and very careful handling to carry out the acclimatization phase. For this reason, it is common that many growers fail to successfully acclimatize vitroplants, incurring losses due to mortality, with consequent cost increases and production delays..

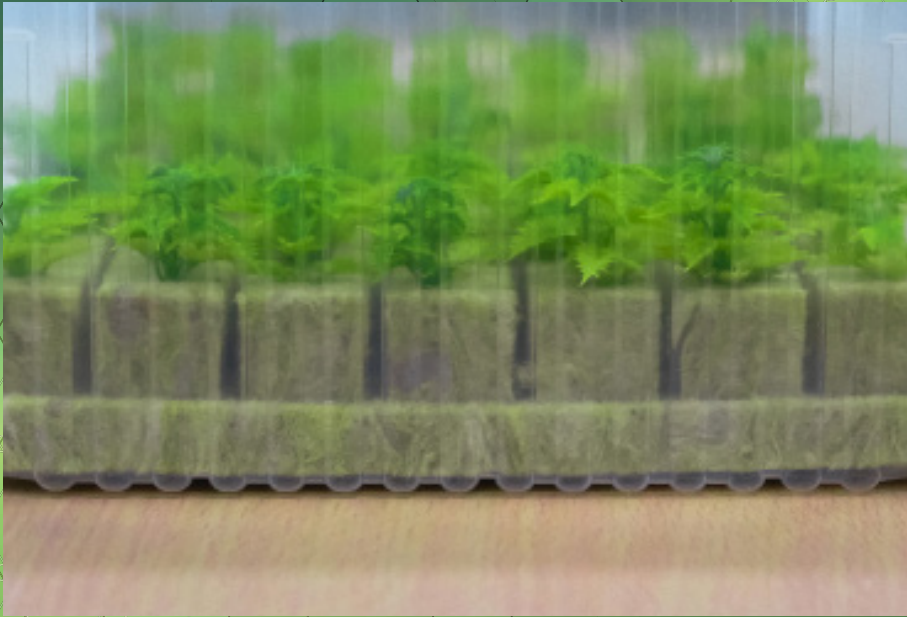
The InEx[®] technology developed by GreenLab allows us to **deliver to our customers pre-acclimatized plants, which do not need to be subjected to the tedious and delicate acclimatization processes**. This material has one of the greatest advantages of in vitro cultivation, which is that it is still in sterile conditions. This not only facilitates and optimizes transportation costs, but also allows export to international markets.

Vitroplants received by our customer under InEx[®] conditions are grown in a sterile and inert substrate, with a special culture medium that activates the plant's energetic metabolism and prepares its physiology for ex vitro growth. In addition, a modern and unique system of special plastic covers is used to control gas exchange and relative humidity. In this way, **the customer can carry out the final acclimatization easily, progressively and with minimum effort**.

When you receive boxes with InEx[®] vitroplants, you simply uncover them and place them in the nursery for a few weeks before transplanting the material into the bag. This reduces the labor associated with handling, cleaning and planting the plants, **which lowers costs and reduces losses** associated with the survival of the acclimatization phase.



Welcome to the Worl of InEx® by GreenLab Biotechnology !



BENEFITS



Optimized transport
(low volume)



Facilitated phytosanitary procedures



Sterile and inert products



Pre-acclimated plants



Easy to use



PRODUCTION CENTER



1^s plant biotechnology laboratory in Panama.

3 research and development centers: Panama, Belgium and France.



7 000 m² of construction:
a cutting-edge laboratory,
an acclimatization greenhouse,
a cultivation greenhouse.



Production capacities

7 000 000 vitroplants/ year

2 000 000 plants/ year



The background features a dark green to light green gradient. It is decorated with hexagonal patterns and molecular structures. In the center, there are four vertical lines: three thin white lines and one thicker yellow line. In the top right corner, there are three horizontal yellow lines.

AVAILABLE AGRICULTURAL SPECIES

BLACKBERRY

BERRIES



The blackberry is native to Europe, Asia and North Africa. It is a woody plant, with long flexible stems full of thorns. The different colors of the fruit determine the degree of ripeness. This fruit is rich in vitamins A, C and E. In addition, because of their anti-inflammatory and antioxidant effects, blackberries are often recommended for patients with arthritis.

Their anthocyanins may reduce the risk of coronary heart disease and prevent cardiovascular system failure. The commercial value of this fruit has increased up to 20% in some markets since 2008, positioning it as an emerging crop of high importance.



BLACK SATIN

Fast growing variety, long canes without thorns and up to 1.5 m high. Shaping and trellising are recommended for better fruit development. Medium sized berries, round and elongated shape. Yields between 15 kg and 25 kg per plant, depending on the technology used. It has moderate resistance to frost.



CHESTER

One of the most popular varieties in the world for being very vigorous, thornless, large-fruited and late ripening. It produces 3-4 m long canes that usually require trellis support. Yields vary according to the area, with up to 31 kg/plant. Winter hardiness is up to 18 degrees below zero.



LOCHNESS

Presenting 'Lochness' blackberry - prolific and packed with deliciousness! Large, glossy black fruits offer a sweet and slightly tart taste, perfect for any palate. This vigorous, upright plant simplifies harvesting and thrives in cooler climates thanks to its disease resistance. Plus, its extended harvest season keeps the bounty flowing for producers and gardeners alike.



THORNFREE

Vigorous creeping plants, with stems up to 5 m long and 2 m high without thorns. Late maturing, with large, oblong, shiny black, very juicy fruits. Yields are high, up to 20 kg/plant when adequate fertilization is used.



TRIPLE CROWN

The 'Triple Crown' blackberry variety takes the crown when it comes to flavor and production. It is a favorite for its exceptionally sweet taste and large size. The plant is semi-erect and known for its high productivity and consistent fruit quality. These juicy berries are perfect for fresh consumption or for preparing jams and desserts. Additionally, the 'Triple Crown' is valued for its disease resistance and adaptability to different soil types.

BLACKBERRY

BERRIES



TUPI

The 'Tupi' blackberry variety, originating from Brazil, has adapted well to various climates. It produces medium to large-sized berries, with an intense flavor and firm texture that make them ideal for transport. They are highly valued in the food industry for their ability to maintain shape and flavor after processing, making them excellent for commercial products like yogurts and cakes.

BLUEBERRY

BERRIES

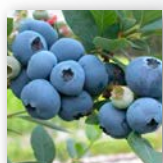
NORTHERN Highbush



This popular blue fruit is one of the fruits with the highest antioxidant content, it also provides vitamin C, potassium and fiber and boosts the immune system. Its daily intake could help improve memory and brain function, in addition to reducing bad cholesterol.



Blueberries contain a substance that prevents any bacteria from adhering to the bladder tissue, so regular drinking of blueberry juice helps prevent urinary tract infections. The fresh market is concentrated in Europe and the United States, although the market for this prized fruit is beginning to increase by up to 80% in Latin American countries such as Mexico.



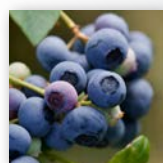
BLUERAY

The 'Blueray' blueberry is an early-producing variety, known for its sweet flavor and vigorous growth. These medium to large-sized blueberries have a beautiful deep blue color and excellent shelf life. Ideal for fresh consumption or freezing, thanks to their firmness and consistent flavor. Farmers appreciate 'Blueray' for its adaptability to a wide range of soils and its abundant production.



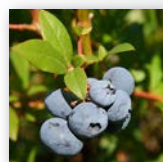
BRIGITTA

The 'Brigitta' variety is known for its long shelf life post-harvest, making it ideal for commercial distribution, in addition to being resistant to Phomopsis leaf spot. These large berries with a slightly tart flavor are perfect for those who enjoy a hint of zest on their palate. 'Brigitta' has a thick skin that protects the berry, allowing it to hold up well during transport. Its ability to maintain post-harvest quality makes this variety an excellent choice for exporters and farmers alike.



EARLY BLUE

Early producing, well formed, upright and vigorous plants with dark green foliage. Produces light blue aromatic berries, ideal for fresh consumption. Self-pollinating, but produces larger yields if pollinated with Bluecrop or Jersey.



ELLIOT

Classic variety of high chilling (800 and 1,200 hours per year), late harvest and with good vigor. Medium size fruit, light blue color, with small and dry scar, but tends to wrinkle at high temperatures.



HURON

'Huron' is a mid-season blueberry variety valued for its adaptability to different climates and soil conditions. Its berries are large, firm, and have a bright blue color. They offer a perfect balance between sweetness and acidity, making them ideal for both the fresh market and baking. Additionally, the 'Huron' plant is robust and consistently produces high yields, making it a favorite among commercial growers.

BLUEBERRY

BERRIES



NORTHLAND

It is one of the most resistant varieties to cold. Vigorous, easy to grow and adaptable to different types of soils and conditions. Its yields are heavy and the fruits are sweet with high sugar content.



OZARK BLUE

One of the sweetest varieties for late production. Quite vigorous and very productive. The fruit is very large, firm, light blue in color and has excellent flavor. It has a staggered ripening of 4 to 6 weeks.

BLUEBERRY

BERRIES

SOUTHERN Highbush



In this group there are several hybrids of the *Vaccinium* genus that are adapted to more temperate climates, so they withstand higher temperatures and have fewer chilling hour requirements. These varieties are suitable for low latitudes, where winters rarely fall below 7 °C. Their main growing area is in the southern United States and Spain, northern Chile and currently areas of Africa and Central America.

They are varieties that behave as early, most of them have a fairly extended harvest period and have a very early flowering and budding. They are plants of higher size so their cultivation is oriented to the fresh market with manual harvesting.



BILOXI

This variety requires very little chilling (150 hours) and is an early flowering and early producer. The fruit is medium sized, light blue, very firm and of excellent flavor. The plant is erect in habit, very vigorous and productive.



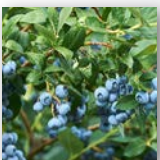
LEGACY

Variety with chilling requirements between 500 to 600 hours. Medium to large fruits, firm and of good flavor, with a marked peduncle scar. It is a high production variety, with early and long flowering.



O'NEAL

Medium chilling plant (200 to 300 chilling hours) widely planted in California, Chile and Argentina. Vigorous plant, up to 1.8 m with erect growth. Self-pollinating, but produces larger plants when planted with another variety.



SHARPBLUE

It produces dark blue berries, sweet and rich in antioxidants. Hardy and vigorous, self-pollinating, early producing and with low chilling requirements (150-250 chill hours). It is more resistant to rot and more adaptable to sandy soils than most varieties.

BLUEBERRY

BERRIES

RABITTEYE – OJO DE CONEJO



Native to South Georgia (USA), this group includes blueberries of the species *Vaccinium ashei*. They are generally more vigorous, productive and easier to grow than Highbush blueberries. They grow in a wide range of soils and require less acidic pH.



They are more drought tolerant and tolerate soils with lower organic matter fraction. These varieties produce smaller fruit, ideally destined for the freezing or processing industry. Their cultivation accounts for more than 15% of the world's blueberry production area. blueberry production worldwide.



CENTURION

Late flowering variety and one of the few self-fertile Rabbiteye. Its fruit is medium sized, dark blue and somewhat sweet. The plants are very vigorous, tall and with bluish green foliage. They have medium chilling requirements (550 to 650 hours).



TIFBLUE

'TiffBlue' is a blueberry variety notable for its cold resistance and late ripening season. The berries are vibrantly blue, large, and uniformly shaped. Their flavor is sweet, with a suitable amount of acidity that enhances their natural sweetness. 'TiffBlue' blueberries are excellent for eating on their own, adding to cereals, or baking. Additionally, the plants are hardy and yield well.

RASPBERRY

BERRIES



Native to Europe and northern Asia, it grows most often in forest gaps or meadows at altitudes up to 1200 meters above sea level. This plant is not suitable for calcareous soils but it grows well in deeper, more acidic soils. It is easy to cultivate. The fruits are rich in ellagic acid, a substance beneficial in the chemo-prevention of certain types of cancer.

Black raspberries contain considerable amounts of anthocyanin, which works against oxygen free radicals, responsible for cell degeneration in mammals. It is one of the temperate climate fruits with the highest unit price and high agro-industrial demand. World raspberry production averages 412 thousand tons per year.



HERITAGE

'Heritage' is a fall raspberry variety known for its ability to produce an abundant harvest. These raspberries are known for their sweet flavor and pleasant texture. Hardy and long-lasting, 'Heritage' plants offer the advantage of a second harvest in the fall after an initial summer production, making them a popular choice for those looking to enjoy fresh raspberries for an extended period.



MEEKER

Variety of non-remontant, conical fruit, uniform, red, with good flavor. The fruit is very good for canning, but it is the best variety for the frozen market. Vigorous, arching plant. Produces long stems that require support systems. It is demanding in cold accumulation (>1,300 hours).



POLKA

The 'Polka' raspberry is one of the newest varieties and has quickly gained favor for its excellent flavor and high fruit production. The berries are large, dark red, and have a firm texture, making them ideal for picking and transport. 'Polka' is also notable for its disease resistance and adaptability to different soil conditions, making this variety a solid choice for commercial producers and home gardeners alike.



RUBY

It is a remontant variety, requiring winter and summer pruning, with medium-sized fruit, bright intense red, medium consistency and good flavor. The bushes tolerate low temperatures well, with very few thorns and reach a height of 1.5-2 m. It has high yields with production of 3-4 kg of berries per bush.



TULAMEEN

Non-remontant variety, large fruit, bright red and firm. Very productive and exceptional for fresh consumption, being the quality reference in raspberry. The plant produces long, erect stems, up to 2 meters high. It tolerates frosts down to -30°C, but is highly susceptible to *Botrytis* and *Phytophthora*.

RASPBERRY

BERRIES



VERSAILLES

The 'Versailles' raspberry is a classic variety that has delighted gardeners with its reliability and sweet taste. With medium to large-sized berries, this variety produces bright red fruits that are both juicy and firm. Ideal for temperate climates, 'Versailles' is resistant to many of the common diseases that affect raspberries. This variety is perfect for fresh eating, making jams, or freezing for off-season enjoyment.



WILLAMETTE

Early, non-remontant variety with small or medium-sized, conical, intense dark red-purple fruit, ideal for juice. Very productive plant, medium vigor, hardy and resistant to winter cold. Tolerant to bud blight (*Didymella applanata*) but sensitive to *Botrytis* in fruit. Early maturing and very productive.

STRAWBERRY

BERRIES



The strawberry plant is a perennial species of the Rosaceae family, native to Europe and North America. It is cultivated for its edible fruit, which is one of the most appreciated and consumed worldwide. In general, strawberries are grown in temperate and cool regions, where the climate is moderate and not too extreme. It requires a fertile and well-drained soil, and the success of its cultivation depends on factors such as climate, water quality and availability of sunlight.

Commercially, strawberries are used in a wide variety of products, from desserts to beverages and cosmetics, and are in constant demand throughout the year. In addition, strawberry products such as jams, syrups and liqueurs are becoming increasingly popular.



ALBION

The 'Albion' strawberry is a modern variety highly popular among growers for its ability to produce fruit throughout the year in suitable climates. These strawberries are characterized by their uniformly conical shape, deep red color, and glossy sheen. With a rich and sweet flavor reminiscent of wild strawberries, the 'Albion' is an excellent choice for fresh consumption and also for making jams and desserts.



FESTIVAL

The 'Festival' strawberry is one of the most cherished varieties in warm regions and is widely grown for its high yield and excellent flavor. Its fruits are large, bright red with golden seeds on the outside, providing an attractive visual contrast. 'Festival' strawberries have a sweet and juicy flavor, making them ideal for the fresh market. Additionally, these strawberries have good resistance to wilting and root rot, making them very popular in areas prone to these issues.



SAN ANDREAS

Meet 'San Andreas': a day-neutral strawberry like 'Albion', but with its own distinct flavor and harvest time. These medium-large berries boast good travelability and a balanced taste, pleasing both sweet and tart lovers. Known for disease resistance and adaptability, 'San Andreas' is a reliable choice for various growers.

CITRUS

CITRUS



Citrus fruits are a group of fruits that originated in Asia and are characterized by their acidic and refreshing taste, as well as their high vitamin C content. Among the best known citrus fruits are orange, tangerine, lemon, lime and grapefruit.



In addition to their nutritional value, citrus fruits have multiple health benefits, such as improving digestion, strengthening the immune system, preventing cardiovascular diseases and reducing the risk of some types of cancer.



ROOTSTOCK «FLYING DRAGON»

Flying Dragon rootstock is a citrus variety used in the production of oranges, lemons and other citrus. It is characterized by its low size and spiny, twisted branches, which give it an unusual appearance.

The Flying Dragon is especially useful in protecting plants from nematodes, a type of worm that can seriously affect citrus roots. It is also believed to help reduce fruit size and increase juice content.

Although not as common as other rootstocks, Flying Dragon has proven to be an effective option for improving citrus production and quality in several regions.



ROOTSTOCK «SWINGLE»

Swingle rootstock is a citrus variety used for grafting several citrus species. It is especially resistant to diseases such as dwarfing virus and citrus tristeza, which affect other citrus varieties.

Swingle originated in the 1900s from a University of Florida citrus hybrid variety (*Duncan x Poncirus trifoliata*). Although it is a relatively new variety, it has become one of the most popular in the citrus industry due to its high hardiness and ability to adapt to different soil and climate conditions.

COCOA

TROPICAL CROPS



Cocoa is a fruit native to the Americas, specifically the Amazon basin in South America, from whose seed chocolate is produced. Its scientific name, *Theobroma*, means in Greek "food of the gods" because of its unique flavor. It is a food that provides minerals, fiber, and is rich in polyphenolic antioxidants with anti-inflammatory properties.

Its cultivation is in a phase of economic recovery, so more and more healthy plants with superior genetics are needed. According to FAO, world production will have an annual growth rate of 2.2% to 2.5%, and represents one of the most important crops worldwide.



ICS-1 ROOTSTOCK

Trinitario hybrid pedigree plant. Red fruit with violet seeds. It is self-compatible, with good productivity and low earliness. The variety is sensitive to brown rot (*Phytophthora palmivora*).



ICS-95 GRAFTED TREE

Hybrid of Trinitario x Criollo also has a selected tolerance to moniliasis. Its trees are large, leafy and robust, with open branches and a lot of foliage. It produces fruits of Creole shape, orange with yellow color. It is a self-compatible material.



IMC-67 ROOTSTOCK

Used today mainly as a rootstock, it is a high yielding material and tolerant to machete disease (*Ceratocystis fimbriata*). It is a self-incompatible variety with a good root system.



PMCT-58 GRAFTED TREE

Trinitario clone selected for its productivity and tolerance to moniliasis. It produces trees of intermediate size with open branches and orange-yellow fruits. Its unique morphological characteristic is that it has a longer pedicel.



HYBRIDS R-4 y R6

Originated from the cross "UF-273 T1 x PA-169" at CATIE. It has been demonstrated that this family produces early descendants, with good production and resistance to moniliasis. Both are trees of intermediate size and dense foliage, producing yellow with orange fruit.



TSH-595 **GRAFTED**

High yielding material adaptable in temperate zones, with oblong shaped, ripe fruits of intermediate red color, violet seeds, intense fruity flavor. It is self-compatible and susceptible to Monilia.



UF-613 **ROOTSTOCK**

Trinitario hybrid used as a rootstock. Like IMC-67, it is self-incompatible, tolerant to *Ceratocystis fimbriata* and susceptible to Monilia (so it is not recommended as a graft).

ARABICA COFFEE

TROPICAL CROPS



This coffee represents around 60% of the world production since, in general terms, its cup quality is superior. Certain varieties of arabica coffee are auctioned in international markets due to their high quality, leaving robusta coffee mainly for industrial processes. It requires adequate areas and a little more care than robusta coffee.



There are diverse commercial varieties, with different agronomic requirements, resistance to diseases and cup quality that allow its cultivation to be adapted to the needs of the producer and the international markets. Its cultivation generates annual income of more than USD \$15 billion for exporting countries, and provides a source of employment for more than 20 million people in the world.



CENTENNIAL BOURBON

The Bourbon Centennial is likely a commemoration or special selection within the Bourbon family. This variety might stand out for retaining the desirable characteristics of traditional Bourbon, such as its sweetness and full body, while offering a unique profile that celebrates the heritage and history of this cherished coffee species.



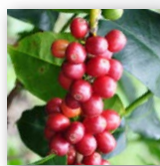
CATURRA

It is a natural mutation of the Bourbon variety, which has a single gene variation that makes the plant smaller. It has good yield potential and standard quality in Central America. It is a variety with high susceptibility to rust, cherry anthracnose (CBD) and nematodes. The optimum altitude is around 1000 to 1600 meters above sea level.



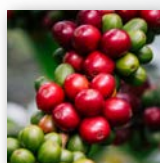
CATUAÍ

The plant is a hybrid between the highly productive Mundo Novo and the Caturra. The plant is highly productive and is characterized by its great vigor and low height (less compact than Caturra). It is highly susceptible to rust, cherry anthracnose and nematodes. The optimum altitude is around 1000 to 1600 meters above sea level.



GEISHA

Harvested in Ethiopia in the 1930s, it is a coffee of extraordinary quality at high altitudes. It was distributed in Panama in the 1960s because of its tolerance to rust. The plant is tall, with fragile branches and susceptible to CBD and nematodes, so it was not favored by growers. It became popular after 2005, when it received exceptionally high ratings and broke price records at coffee auctions.



JAVA

Ethiopian variety selected for its tolerance and vigor. Tall growth habit, bronze colored bud, large fruit and very good cup quality. It is tolerant to rust and CBD, and has low fertilizer requirements. Good choice for small growers in areas without nematode problems. Optimum altitude is around 1000 to 1600 meters above sea level.

ARABICA COFFEE

TROPICAL CROPS



PACAMARA

The Pacamara variety is a hybrid of the Pacas and Maragogipe varieties, known for its unusually large beans and a balanced cup profile. This coffee can offer a wide range of flavors, from sweet notes of chocolate and red fruits to floral and herbal nuances, depending on its growing region and processing. It's a variety that has gained popularity among artisan producers and specialty coffee enthusiasts.



OBATA

The Obatá variety, originating from Brazil, is known for its disease resistance and versatility at different altitudes. This variety produces a consistently high-quality cup with notes of ripe fruit and moderate acidity. It is a popular choice among producers for its adaptability and reliable production cycle.



SL-28

Drought tolerant variety of the Bourbon group with exceptional cup quality potential. Susceptible to the main diseases such as rust, cherry anthracnose and nematodes. The plant is tall, with a green shoot and large fruit. The optimum altitude is around 700 to 1200 meters above sea level.



YELLOW BOURBON

The Yellow Bourbon is a mutation of the traditional Bourbon coffee, with beans that mature to a golden yellow hue. This variety is celebrated for its slightly sweeter taste than the Red Bourbon and for its mild and well-balanced acidity. Farmers value Yellow Bourbon for its resistance, for example to rust, and consistency in producing high-quality beans.



YELLOW CATURRA

Connoisseurs treasure Yellow Caturra for its unique yellow beans and vibrant, fruit-tinged flavor. Descending from Bourbon, these short-statured bushes yield abundant harvests of cups kissed with citrus, jasmine, or tropical fruit whispers.

HYBRID COFFEE

TROPICAL CROPS



F1 hybrids were developed in the 1990s by CATIE, CIRAD and PROMECAFE. After more than 15 years of research and validation, they were commercially released because they have a high productive potential (between 30 and 50% more than the currently used commercial varieties), vigorousness, adaptation to adverse climate conditions (drought, waterlogged soils, frost) and excellent cup quality.

These materials are an important development for the coffee industry because they are superior plants, resistant to rust and have an extraordinary cup quality. The flavor and aroma are delicious compared to many traditional varieties.



CASIOPEA

It is a hybrid between Caturra 7 and local Ethiopian variety (ET41), so it is reproduced only by micropropagation. The plant has a low growth habit and large fruit, with susceptibility to rust, cherry anthracnose (CBD) and nematodes. Very high yielding variety if planted in healthy soil, with exceptional quality at high elevations. It is recommended for altitudes between 1300-2000 meters above sea level.



MILENIO

It is also a hybrid product of crossing a Sarchimor T5296 and a wild variety of Rume Sudan. Like the Central American, the plant is short and large-fruited, with very high yields and very good cup quality. The variety is rust resistant, CBD tolerant and susceptible to nematodes. It is recommended for altitudes between 1300-2000 meters above sea level.

ROBUSTA COFFEE

TROPICAL CROPS



It is a coffee tree native to the tropical forests located around the crescent of Lake Victoria in Uganda. At the beginning of the 20th century it began to be produced in Southeast Asia. In general, the robusta coffee plant is more resistant than the arabica and its requirements for altitude and climatic conditions are lower. However, its cup quality is inferior, which is why it is only cultivated in areas where Arabica would not be able to grow.

More than 40% of the world production is Robusta coffee, and during the last decades the volume of its production has grown, becoming a competition for Arabica coffees, especially in low altitude zones.



IMPROVED ROBUSTA

These are Robusta cultivars BT-42 and BT-358 selected in Panama by IDIAP-MIDA. It has been widely recommended and cultivated in the areas of Coclé and West Panama. It has some resistance to orange rust and an average yield of 5 to 6 quintals per hectare.



MIDA's ROBUSTA SELECTION

MIDA Robusta Coffee is a coffee of Panamanian origin, produced in lowlands with the support of MIDA (Ministerio de Desarrollo Agropecuario). The plant is resistant to pests and diseases, and has a high caffeine content. The coffee has a strong and earthy flavor, ideal for espresso and milk drinks.

DRAGONFRUIT

TROPICAL CROPS



It is a cactus from America, very resistant to droughts. There are two main types: the white-fleshed and the red-fleshed, although there are many crosses between the two. It is usually entangled in the trees as a support and climbs the branches up to eight or ten meters from the ground.



Its fruit is rich in natural antioxidants and vitamin C that help to reduce the risk of suffering cardiovascular diseases, degenerative diseases or cancer. The captine it contains helps to relax the nervous system. It also contains vitamins B1, B2 and B3, vital for the production of red blood cells.



AMERICAN BEAUTY

The 'American Beauty' dragon fruit variety is known for its intensely pink skin and bright magenta flesh sprinkled with tiny black seeds. This variety offers a sweet and tropical flavor with a smooth and creamy texture, making it a favorite for fresh consumption as well as for juices and cocktails.



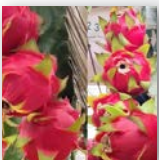
ARRIZA

The 'Arriza' variety might be less known or perhaps a specific local denomination. Generally, dragon fruits of this type offer a flesh that can vary in hue and flavor, but always tends to be refreshing, slightly sweet, and with a texture ranging from smooth to crisp.



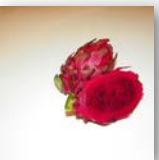
ASUNTA 5

The 'Asunta 5' is a medium to large red hybrid variety that may present white flesh, with a flavor that is a mix of sweet and sour with floral notes. It is a recently created variety that is already gaining popularity among dragon fruit enthusiasts as it adapts to different climates and soils with high yield and resistance to diseases and pests.



CARAMEL OF DESERT

The 'Caramel of Dessert' is an exceptional variety with a flesh that resembles the taste of caramel, hence its name. Its internal color can vary from white to a slightly pink hue, and it is highly valued for its exceptional sweetness and melt-in-your-mouth consistency, ideal for desserts or as a natural treat.



EL GRULLO

This variety has exceptional tolerance to both heat and cold. Its fruit is large oval in shape with purplish-green fins on a red skin and deep red flesh. The average fruit weight is 1 lb. The fruit has a pleasant sweetness.

DRAGONFRUIT

TROPICAL CROPS



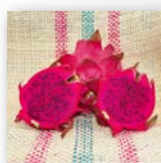
LA VERNE RED

The 'La Verne Red' is a variety with dark red, almost wine-colored flesh, that is both striking and delicious. It offers a deep and rich flavor that is well balanced with just the right amount of sweetness, making it highly desirable for direct consumption and in the making of jams and jellies.



LISA

The 'Lisa' dragon fruit is characterized by its yellow skin and white flesh, offering a striking visual contrast. It is known for its refreshing and slightly sweet flavor, and is perfect for a variety of culinary uses, from exotic fruit salads to creative decorations in gourmet dishes.



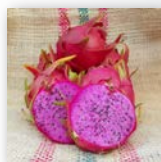
MAKISUPA

A self-pollinating variety that produces excellent red-fleshed fruit with a slightly astringent sweet flavor. The fruit has short green fins surrounding the reddish pink surface and is medium to large in size, weighing 1 to 1.25 lbs.



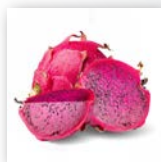
PALORA

The 'Palora' variety, originating from Ecuador, is famous for its large size and bright yellow skin. Its flesh is also a vivid yellow, with a flavor that leans more towards sweet and is extremely juicy, making it very appealing in fresh markets and in the juice industry.



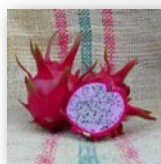
PHYSICAL GRAFITI

This variety produces a pinkish red skinned fruit with light purple sweet flesh. Its fruits are medium to large in size, weighing up to 1.5 lbs. Its productivity, flavor and growth are among the highest. It is self-sterile and does not receive pollen from white-fleshed varieties.



PINK

This is a variety with dark red flesh and red skin. It is one of five known varieties grown commercially in Nicaragua. The fruit is delicious, with good flavor, sweetness and average weight of 1 pound.



PINK DELIGHT

It is a self-pollinating and very fertile variety that will bear fruit on its own. However, hand pollination is recommended to ensure fruit set and larger fruit size. The flesh has a unique pinkish hue that has a delicious flavor.

DRAGONFRUIT

TROPICAL CROPS



PINK PANTHER

Its fruit has a good balance between acidity and sweetness, and is quite refreshing when cooled. This variety is self-pollinated and its pollen is a great source when crossed with other varieties. This variety grows well and is a very stable grower.



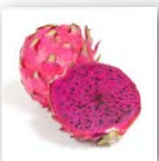
PITAGRO

Meet Pitagro: spineless & speedy, with big, juicy, sweet & fragrant white flesh! A high-yielding, pest-resistant dream for growers, it thrives in many climates & is surprisingly easy to cultivate. Packed with vitamins, Pitagro's a delicious & profitable choice!



SALMON

The 'Salmon' variety has a distinctive salmon-colored flesh, providing a balanced flavor between sweet and sour. Its texture is crisp and its unique taste makes it ideal for incorporation into salads, main dishes, or simply to enjoy on its own.



VENUS

Developed in Israel by Ben-Gurion University of the Negev. Fast growing and compact plant, which reduces pruning work. Although it cannot self-pollinate, it can receive almost any type of pollen from other plants.



VIETNAMESE WHITE

Self-pollinating variety imported from Vietnam. It has white, sour flesh with a watermelon texture. The spectacular colour contrast between inside and outside is what makes this variety so popular with growers and consumers around the world.



YELLOW THAI

It is a self-pollinating and very fertile variety that sets without the need for hand pollination. Fruit size is usually just over 1 pound, with a mild sweet flavor and a lemony aftertaste. The outer skin is a thick, smooth pink with yellow fins when fully ripe.



ZAMORANO

Originaria de Honduras, esta variedad es de fruta pequeña a mediana. La piel de la fruta es roja con aletas de color verde oscuro, y su pulpa rojo carmesí, de sabor dulce y suave. Es ideal para consumo fresco, en mermeladas, como guarnición o incluso en forma de zumo en bebidas.

MANGO

TROPICAL CROPS



Mango is a tropical fruit highly appreciated worldwide for its flavor, as well as for its nutritional benefits. It is grown mainly in hot and humid regions. This tree can reach up to 30 meters in height and requires well-drained, nutrient-rich soil for healthy growth. In addition to its delicious taste, mango is also a rich source of vitamins, minerals and antioxidants, and has been shown to have health benefits such as improving digestion, strengthening the immune system and reducing the risk of chronic diseases.



CRIOLLO MANGO ROOTSTOCK

The curiously named "Huevo de Burro" is a traditional variety from Panama, rustic and resilient, mainly used as a rootstock.



KEITT

The Keitt mango is distinguished by its impressive size and oblong shape. With a rich and subtly sweet flavor, this variety is perfect for those who prefer a less cloying fruit. Its juicy flesh and minimal fibrousness make Keitt an excellent choice for fresh consumption or use in recipes. Its green skin is tinged with hints of yellow when ripe, signaling it's ready to delight the palate.



KENT

Kent is a mango variety highly prized for its exceptional sweetness and fiberless flesh. It is often sought after for its buttery consistency and colorful exterior that blends green and reddish tones. A large and juicy mango, Kent is ideal for smoothies or simply enjoying in slices. Kent's season is highly anticipated by mango enthusiasts, promising an exquisite taste experience.



PALMER

Palmer is a mango variety valued for its disease resistance and attractive elongated and rounded shape. Its purple and red skin indicates ripeness and encloses a vibrant orange, smooth, and almost fiberless pulp. With a flavor that perfectly balances sweet and tart, Palmer is both a visual and gustatory pleasure, making it a popular variety for fruit salads and desserts.



NAM DOC MAI

Originating from Thailand, Nam Doc Mai is a globally renowned mango distinguished by its elongated shape and bright yellow skin. It is exceptionally sweet and aromatic, with a soft and sticky pulp ideal for fresh consumption or as the star of both sweet and savory dishes. In Asia, it is often enjoyed with sticky rice as a traditional dessert.

PAPAYA

TROPICAL CROPS



Papaya or pawpaw is a fruit of tropical climates. It has a sweet taste, vibrant color and a wide variety of health benefits, making it a popular fruit. Once considered an exotic and rare fruit, papaya is now available at most times of the year.



The potential health benefits of consuming papaya include reduced risk of heart disease, diabetes, cancer; improved digestion, lower blood pressure and improved wound healing.



MARADOL

Maradol papayas are a large, sweet, and creamy variety grown in Panama and other parts of Central America. They have a bright yellow skin when ripe and are a good source of vitamins A and C. Maradol papayas can be eaten fresh, frozen, or canned. They are also a popular ingredient in smoothies, salsas, and chutneys.

PINEAPPLE

TROPICAL CROPS



The pineapple, *Ananas comosus*, was named after the term "ananas" derived from the Tupi language of Brazil, which means "delicious fruit". The pineapple plant is as peculiar as its fruit, producing only three pineapples on average in its lifetime, with the first one being (usually) the largest.



Thanks to micropropagation, it is possible to obtain the necessary plants to continue enjoying this fruit. Over the last 100 years, it has become one of the main fruit crops in the tropics, with production and export growth of up to 4% per year.



MD2

It is a hybrid resulting from a complex mixture of varieties, where more than 50% corresponds to Cayena Lisa. It is a pineapple with high uniformity and consistency in size and maturity, which produces a very sweet fruit, with low acidity and twice as much vitamin C as other pineapple species.

BANANA

TROPICAL CROPS



It belongs to the musaceae group, is native to tropical America but its cultivation and consumption have spread widely. Bananas are rich in carbohydrates and energy, vitamin C, B6 and antioxidants. It is a source of minerals such as magnesium, iron, manganese and potassium, which are very important for the maintenance of our muscles, as well as for keeping blood pressure stabilized.

In addition, its fiber content helps to provide a feeling of satiety and thus combat food cravings. Bananas are the fourth most important food crop in the world, after rice, wheat and corn.



BUCHU OR MANZANO

Banana of the orito variety (*Musa acuminata AA*), also known as baby banana or primitive. Its plants are smaller and wilder than the Cavendish, its clusters give between 6 and 11 hands, and its very sweet fruits measure from 1 to 3.5 inches. It is planted between 200 and 800 meters above sea level.



GRAND NAINE

A variety of the Cavendish subgroup, with a thick pseudostem 2.50 to 2.70 m high with a brownish mottling. It has broad leaves, medium-sized fruit of excellent quality and is wind and drought tolerant. The average bunch weight is 30 to 35 kg.



WILLIAMS

A variety of the Cavendish subgroup, with a thick pseudostem 2.50 to 2.70 m high with a brownish mottling. It has broad leaves, medium-sized fruit of excellent quality and is wind and drought tolerant. The average bunch weight is 30 to 35 kg.

PLANTAIN

TROPICAL CROPS



The plantain is a tropical fruit originating in Southwest Asia, belonging to the Musaceae family (it is a triploid hybrid of *Musa acuminata* and *Musa balbisiana*). Its fruit is eaten green or ripe alike and can be prepared fried, roasted, boiled and baked. It is a very versatile food rich in starch and energy.

It is used industrially for the production of chips and floury derivatives. It grows relatively easily and can be used as a source of shade in coffee and other crops. The export of this product is becoming increasingly important, with an increase of up to 9% in the international market.



CURARE ENANO

It is the most widely accepted variety in the international market and the most cultivated worldwide. It is very easy to handle and has a small size (2.5 and 3 m). It produces between 25 to 30 commercial fingers per plant and about 7 offspring. It is much less susceptible to lodging, but is sensitive to sigatoka attack.



CUERNO (BLANCO/ ROSADO)

The horn type cultivars are named for the upward curved shape of their fruits. It is the most cultivated and commercialized type of banana in Panama. Its average yield is 18 to 20 commercial fingers per plant, which are not very perishable. It has medium tolerance to black sigatoka but is susceptible to BSV and the black weevil.



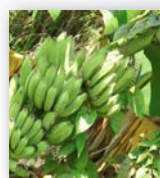
FHIA 20

The FHIA-20 plantain, also known as 'Goldfinger', is a hybrid variety developed as part of a program to improve disease resistance and increase productivity. This variety is notable for its resistance to Panama disease and Black Sigatoka, two of the most damaging diseases for bananas and plantains. FHIA-20 bananas have a sweet and slightly acidic taste and a firm texture, making them excellent for fresh consumption or in cooking.



MP1

The MP1 plantain variety might be a specific selection or development, possibly aimed at improving certain characteristics like productivity, flavor, or disease resistance. MP1 bananas can be recognized for their consistent performance and the quality of their fruit, which adapts well to both the local and export markets.



PAREDES

The Paredes variety is less known in the international market but offers distinctive characteristics that can be highly valued at the local level or in niche markets. These plantains usually have an elongated shape and a skin that turns to a deep yellow hue when ripe. Their flesh is rich and creamy, ideal for traditional dessert preparation and also enjoyed fresh.

CASSAVA

ROOTS AND TUBERS



Its scientific name is *Manihot esculenta*, and it is also known as manioc, cassava or casava. It is a perennial shrub of the euphorbiaceae family widely cultivated in America, Africa and Oceania for its starchy roots of high food value. It is native to central South America and was introduced with great success in African areas with similar climatic conditions.

World cassava cultivation has been increasing, currently representing between 24 and 27% of world production of tubers and roots, and 55% of national production in this category.



BRASILEÑA

One of the most widely planted cultivars in Panama due to its yield and adaptation to the country's agroclimatic conditions. Its production is subject to agronomic management, growing conditions and damage by insects or diseases. Cassava has a starch content of over 30%, useful for multiple uses.



SEÑORITA

It is recognized by the production of tan colored buds and elongated yuccas, mainly used for freezing and flake production. This variety has a short oxidation period, so it must be processed or consumed very quickly after harvest.



VALENCIA

It is the most demanded variety in the national and international market. It is characterized by its purple petiole, lanceolate leaves and pronounced peduncle, important for waxing. The cassava is short and conical in shape, ideal for the fresh or waxed market.

POTATO

ROOTS AND TUBERS



The potato has been a source of food for humans for more than 9,000 years and today it is the third most important food crop in the world, after rice and wheat. It originated in what is now southern Peru and the northwest of the Bolivian Andiplano, where most of the more than 4000 identified varieties are found.

It contains a large amount of micronutrients, vitamins, carbohydrates (in the form of starch) and vegetable proteins. Total world production of the crop exceeds 300 million metric tons.



GRANOLA

Named as "the potato of the year 2014" in Germany, it is highly adapted to high floors and widely used for its earliness and preference in the market for fresh consumption. It produces tubers with yellow color, smooth skin, shallow eyes and round shape. In addition to its resistance to nematodes and leaf roll virus (PLRV), it is characterized by its good flavor and high yields.

TARO OR DASHEEN

ROOTS AND TUBERS



Colocasia esculenta, also known as taro or dasheen in Panama, is a perennial herbaceous plant belonging to the *Araceae* family. It is native to Asia and Africa but is widely cultivated in various tropical and subtropical regions of the world.



It has large leaves with a long and fleshy petiole that emerges directly from the rhizome, which is known for its high content of starch and vitamin B6, giving it a high nutritional value. It reproduces mainly through rhizome planting, and requires soils rich in organic matter, well drained and slightly acidic.



DASHEEN

Local Panamanian selection of *C. esculenta* traditionally cultivated in the district of Chiriqui Grande and regions of the region. It generates plants of good size with large heart-shaped leaves. The skin of the tuber is brown with white pulp, which may have pink to lilac veins.

YAM

ROOTS AND TUBERS



The yam is a climbing plant native to hot and humid areas, which has been cultivated for its edible tuber for thousands of years, especially in Africa, South Asia and the Pacific Islands. The tuber can reach up to 1.5 meters and weigh up to 70 kilograms with a diameter of almost 15 centimeters.



It has a rough, brown to pinkish-gray skin, with a white, starchy interior. Its production ranks fourth in the world in the category of tubers and roots, and represents 33% of national production in this category.



BABOSO

It corresponds to the *Dioscorea alata* variety, which is widely used in local cuisine. The plant is native to the Americas and is highly prized for the flavor and fine texture of its tubers. The yam it produces has approximately 38% waxy starch, which lacks amylose, used as a binder and thickener.



DIAMANTE

A variety of the genus *Dioscorea alata*. It is a very resistant plant to anthracnose that produces a hard-skinned yam with a brown to pinkish-gray color, whose interior is starchy white. It has a simpler flavor than Hawthorn, so it is more commonly used to produce flour or starch.



WEST AFRICAN

Yam of the genus *Dioscorea rotundata*. It is a tropical plant of African origin. It is characterized by its thick and large leaves, as well as the tiny thorns that emerge from them. The tuberous rhizome is cylindrical in shape, with smooth brown skin and firm white flesh.

PURPLE YAM

ROOTS AND TUBERS



It is one of the first crops used by man, since its history dates back to the most primitive cultures. The ñampí plant is herbaceous, reaches heights of up to two meters and has long green leaves during the vegetative period or yellowish when the corms ripen. This plant usually does not produce seeds, but generates cormels or tubers that are used in human and animal food.



It is considered a great food because it contains a large amount of nutrients, carbohydrates and proteins that are necessary to maintain a healthy and balanced diet.



PURPLE

The Purple Yam is a tuber revered for its distinctive coloring and robust nutritional profile. This purple variety is particularly rich in antioxidants, especially anthocyanins, which give it its intense hue and health benefits. Its smooth texture and earthy flavor make it a versatile addition to the kitchen, ideal for boiling, roasting, or including in stews.

YAUTIA OR COCOYAM

ROOTS AND TUBERS



The tuber, commonly known as cocoyam or tiquisque, belongs to the genus *Xanthosoma spp.* and is widely appreciated for its creamy texture and mild, slightly sweet flavor. The plants are herbaceous, with 3 to 18 segments, and have heart-shaped leaves 40 to 200 centimeters long. The reproduction of the species is carried out mainly by the partition of cormels or by offspring.



Its root is rich in potassium and dietary fiber, stands out for its nutritional properties and is positioned as a healthy option to diversify the diet. The culinary versatility of otoa allows its incorporation in multiple preparations, providing a distinctive and satisfying touch to dishes.



WHITE

The White Yautia or Cocoyam variety is a tuber known for its smooth skin and creamy white flesh. This tuber is valued for its delicate flavor, reminiscent of a mix between potato and chestnut, and a texture that holds up well during cooking. Its high starch content makes it ideal for thick dishes and purées, and it performs exceptionally well when fried, offering a crispy exterior and soft interior. Agriculturally, White Otoa is hardy and adapts well to moist and fertile soils.



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