Bioversity International

Farmers' Handbook on Introduced and Local Banana Cultivars in the Philippines

FS dela Cruz Jr., LS Gueco, OP Damasco, VC Huelgas, FM dela Cueva, TO Dizon, MLJ Sison, IG Banasihan, VO Sinohin, and AB Molina, Jr.

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Foreword

The Department of Agriculture-Bureau of Agricultural Research (DA-BAR), in its efforts to establish a strong, relevant, and responsive research and development foundation in the country, has gone farther up the road by supporting researches that have direct impact to the alleviation of poverty in the countryside.

DA-BAR, along with Bioversity International and the University of the Philippines Los Baños, have taken up the cause of the banana industry – an industry that is the source of the country's major foreign exchange in the fruit sector. It is likewise kept afloat by commercial enterprises and the collectively significant small-hold farmers across the country. This evident relevance of the bananas to the grassroots' economic well-being makes our partnership with international institutions and state universities all the more relevant and timely. I believe that this is a highly significant avenue to pursue because at present, while our bananas continue to dominate the international export market, the long distressed banana industry in Northern Luzon is slowly rising from the ashes of its devastation from the banana bunchy top disease (BBTD). As economic opportunities start to pour into these small-hold and commercial banana enterprises, an opportunity to pursue commercially responsive and demand-driven research opens up as well.

This is how I envision BAR to grow as an institution, whose mandate is being fine-tuned everyday by the needs of our stakeholders. It is my hope that this handbook will be able to provide a comprehensive reference to researchers, technicians, and farmers alike, who wish to embark into the world of the diversity of *Musa sp*.

NICOMEDES P. ELEAZAR, CESO IV
Director

Preface

Banana is the most important fruit crop in the Philippines. It ranks first in production (>5.63 million metric tonnes) and area harvested (415 000 has) (BAS 2005) among other fruit crops. Save for the export banana, which is a significant source of foreign exchange, banana is grown largely by small-holder farmers, traded by local entrepreneurs and consumed locally. Thus, it plays a major role in food security and income generation of the rural poor.

Over the years, *Musa* researchers worldwide have developed a number of new, high yielding and disease-resistant cultivars of banana. Today, these improved cultivars are being made available for testing and distribution to small-holder farmers by Bioversity International. The availability to the local banana industry of these improved cultivars and superior landraces from foreign sources is a shortcut to a long, tedious and expensive banana breeding programme. It is believed that the introduction of these new cultivars as a component of an integrated crop management strategy involving the use clean planting materials, could have a rapid and significant impact on levels of production of banana in the Philippines.

In 21 March 2001, the National Plant Genetic Resources Laboratory (NPGRL) of the Institute of Plant Breeding (IPB), University of the Philippines Los Baños (UPLB) received *in vitro* plantlets of 22 *Musa* accessions from Bioversity International *Musa* Germplasm Transit Centre in Leuven, Belgium. The introduction was facilitated and coordinated by Bioversity Asia Pacific Office. In addition to the introduced varieties, the NPGRL collected important local cultivars. These are being maintained as disease-free foundation stocks. These materials were treated initially as a germplasm collection and were maintained in cultures at the Plant Cell and Tissue Laboratory and in insect-proof screenhouse at IPB.

In January 2004, Bioversity established the National Repository, Multiplication and Distribution Centre (NRMDC) at the NPGRL, IPB-UPLBCA through funds provided by the Department of Agriculture – Bureau of Agricultural Research (DA-BAR). The NRMDC was given the responsibility of introducing and maintaining disease-free foundation stocks of improved, high-yielding and diseases-resistant varieties from Bioversity and local cultivars as well making them available to farmers, researchers and other interested individuals and institutions. It also conducts farmer-participatory evaluation trials to determine local adaptability, yield and quality characteristics of the introduced varieties and multiplies selected cultivars (both introduced and local) for wider distribution to farmers and other interested users.

This manual provides information on the morphological and agronomic traits, fruit characteristics, reactions to common diseases, and uses of 21 introduced and 8 local cultivars based on field trials carried out through the Bioversity-DA-BAR-NRMDC programme. It is intended to serve as a useful guide in the identification and selection of cultivars for further evaluation by researchers and planting by interested banana growers.

AGUSTIN B. MOLINA, Ph.D.
Senior Scientist and Regional Coordinator
Bioversity International CfL-Asia Pacific

Introduced cultivars

Twenty-one cultivars composed of hybrids and landraces were introduced from the Bioversity-managed International Transit Centre (ITC) at Katholieke Universiteit Leuven (KUL) in Belgium. The improved hybrids were products of a network of breeding programs collaborating with Bioversity International namely, Fundacion Hondureña de Investigacion Agricola (FHIA), the French Agricultural Research Centre for International Development (CIRAD), International Institute of Tropical Agriculture (IITA), and Taiwan Banana Research Institute (TBRI). The introduced landraces are important cultivars used in the breeding programs and are already being used as commercial cultivars in banana-growing countries.

FHIA-01

FHIA-01 Facts

Agronomic Characters	FHIA-01
Plant height (cm)	281
Pseudostem girth (cm)	56
Days to flowering	230
Days to harvest	364
Days from flowering to harvest	134
Bunch weight (kg)	22
Number of hands per bunch	9
Number of fruits per bunch	126
Fruit weight (g)	117
Fruit length (mm)	124
Fruit width (mm)	38
Fruit thickness (mm)	37
Fruit shape	curved
Mature fruit peel color	yellow green
Flesh weight (g)	79
Pulp color at maturity	cream
Flesh texture	firm
Edible portion (%)	68
Predominant taste	sweet
Pulp TSS (˚Brix)	19

FHIA-01 is a sturdy dessert banana with apple-like flavor. It is a strong plant, that's tolerant to cold temperature. It is prepared into cakes, and into honeyed and salted chips. It is also known as the "Goldfinger".

This cultivar is developed by the Fundacion Hondureña de Investigacion Agricola (FHIA) in Honduras. It is a hybrid of Prata Ana (Dwarf Prata) and SH 3142 . It has a strong root system, which makes it a hardy plant under marginal water and soil conditions. FHIA-1 is tolerant of drought.

Reaction to Diseases

It is known to be resistant to BBTD (banana bunchy top disease) as characterized by low incidence and late onset of infection, and black sigatoka disease. FHIA-01 can be grown with considerably less fungicide than that required to control diseases on plantations of current export bananas. It is likewise known to be resistant to crown rot diseases, and Races 1 and 4 of *Fusarium oxysporum* f. sp*. cubense* (*Foc*), the causal organism of Fusarium wilt. The cultivar is also resistant to nematodes. Due to its inherent resistance to diseases, the variety remains productive for several generations.

Fruit Quality and Potential Uses

FHIA-01 is primarily a table banana, which is often described as with an apple-like flavor. However, may also be cooked or boiled when green or unripe. Unripe and ripe pulp is also processed into chips while the peel, which is yellow-green at maturity, can be fed to livestock, and may be used as a tenderizer.

The fruits are slightly ridged and blunt-tipped. It has excellent green life after harvest, which makes it suitable for export.

FHIA-02

FHIA-02 Facts

FHIA-02 has intermediate plant height, intermediate yield, and heavy fingers. It is highly resistant to black sigatoka and crown rot disease. It may be eaten fresh as dessert, or processed into banana chips. It is also known as "Mona Lisa".

Agronomic Characters	FHIA-02
Plant height (cm)	271
Pseudostem girth (cm)	53
Days to flowering	246
Days to harvest	344
Days from flowering to harvest	98
Bunch weight (kg)	24
Number of hands per bunch	9
Number of fruits per bunch	130
Fruit weight (g)	101
Fruit length (mm)	126
Fruit width (mm)	37
Fruit thickness (mm)	35
Fruit shape	straight in the distal part
Mature fruit peel color	yellow green
Flesh weight (g)	71
Pulp color at maturity	cream
Flesh texture	firm
Edible portion (%)	70
Predominant taste	mild
Pulp TSS (˚Brix)	20

This cultivar was developed by FHIA in Honduras. It is a hybrid of Williams and SH 3393. The plant is similar to Cavendish, but with shorter post-harvest green life.

Reaction to Diseases

FHIA-02 is moderately resistant to BBTD, and highly resistant to black sigatoka disease. The cultivar, however, is susceptible to nematodes.

Fruit Quality and Potential Uses

Fruits may be cooked, boiled, or processed into chips when green or unripe. The peel of the fruit can be fed to livestock, and may be used as a tenderizer.

The fruits are straight at the distal part, slightly ridged, and blunt-tipped. Fruit peel is yellow green at maturity and peels off easily while the pulp color is cream at maturity. The fruit is sweet with tart, apple-like flavor, and maybe eaten as table banana when ripe.

FHIA-03

FHIA-03 Facts

Agronomic Characters	FHIA-03
Plant height (cm)	333
Pseudostem girth (cm)	83
Days to flowering	271-307
Days to harvest	371-417
Days from flowering to harvest	100-110
Bunch weight (kg)	23
Number of hands per bunch	12
Number of fruits per bunch	177
Fruit weight (g)	132
Fruit length (mm)	126
Fruit width (mm)	45
Fruit thickness (mm)	38
Fruit shape	curved
Mature fruit peel color	yellow
Flesh weight (g)	94
Pulp color at maturity	white
Flesh texture	soft
Edible portion (%)	71
Predominant taste	Astringent
Pulp TSS (˚Brix)	22

FHIA-03 is a table and cultivar . It is a strong plant, supporting bunches of up to 50 kilograms without propping.

FHIA-03, developed by FHIA in Honduras in 1987, is a dwarf cooking banana of “Bluggoe” type. It is commercially produced in Cuba and planted to more than 3,500 hectares. It can be grown in marginal soils, tolerant to prolonged drought, and grows well at 0 to 1,500 meters above sea level altitudes.

Reaction to Diseases

The hybrid is resistant to Race 1 of *Foc*, black sigatoka leaf spot disease and moko diseases.It is also partially-resistant to the burrowing nematode, *Radopholus similis*, but is susceptible to *Pratylenchus coffeae*.

Fruit Quality and Potential Uses

FHIA-03 has excellent taste when cooked unripe, while the ripe fruit has apple-like flavor.

Once the bunch is harvested, the cultivar has short green life. The hands should be harvested one at a time from the plants as needed. This partial harvesting of fruit from bunches, which remain on the plants, prolongs the green life of the remnant fruit. By using this technique, green fruit for cooking is available from the same bunch to over a 2-month period. It is also good for home-gardens.

FHIA-17

FHIA-17 Facts

Agronomic Characters	FHIA-17
Plant height (cm)	306
Pseudostem girth (cm)	61
Days to flowering	320
Days to harvest	419
Days from flowering to harvest	99
Bunch weight (kg)	37
Number of hands per bunch	12
Number of fruits per bunch	201
Fruit weight (g)	155
Fruit length (mm)	157
Fruit width (mm)	40
Fruit thickness (mm)	41
Fruit shape	curved
Mature fruit peel color	yellow
Flesh weight (g)	113
Pulp color at maturity	yellow
Flesh texture	soft
Edible portion (%)	73
Predominant taste	mild
Pulp TSS (˚Brix)	18

FHIA 17 is a dual purpose cultivar. The taste and cooking qualities make it ideal for processing into banana chips, a potential source of alternative, value-added livelihood for small scale banana farmers.

FHIA-17, developed by FHIA, is a hybrid between Gros Michel cv. Highgate and SH 3362. It is now being promoted as an ideal cultivar in small-scale farming.

Reaction to Diseases

FHIA-17 is moderately resistant to the BBTD, is highly resistant to black sigatoka disease, and is resistant to Race 1 of *Foc*. The cultivar is susceptible to nematodes.

Fruit Quality and Potential Uses

The fruit is soft with a mild-to-slightly tasty flavor, is ideal as cooking and as table banana. Sensory evaluation studies conducted by IPB-UPLB show that FHIA-17 is preferred over the local Saba variety for processing into honey-coated and salted banana chips. Although its plant-to-harvest duration is one of the longest among the FHIA cultivars, its bunch weight and number of fruits per bunch are also among the highest.

FHIA-18

FHIA-18 Facts

Agronomic Characters	FHIA-18
Plant height (cm)	265
Pseudostem girth (cm)	52
Days to flowering	275
Days to harvest	400
Days from flowering to harvest	126
Bunch weight (kg)	21
Number of hands per bunch	8
Number of fruits per bunch	133
Fruit weight (g)	101
Fruit length (mm)	144
Fruit width (mm)	36
Fruit thickness (mm)	38
Fruit shape	straight in the distal part
Mature fruit peel color	yellow
Flesh weight (g)	68
Pulp color at maturity	yellow
Flesh texture	soft
Edible portion (%)	67
Predominant taste	sweet and acidic
Pulp TSS (˚Brix)	18

FHIA-18 is a semi-dwarf, sturdy cultivar with large bunches and large hands. It is a hardy plant, with fruits of sweet-acidic flavor.

FHIA-18 developed by FHIA, which is a hybrid of Pome cv. Prata Ana and SH 3142. This is a cultivar that must be allowed to ripen fully (with no green tips on the fruit) before it is consumed. The plant can support large bunches without the need for propping.

Reaction to Diseases

The plant is moderately resistant to BBTD, and is resistant to yellow sigatoka and black sigatoka. It can also tolerate high nematode population.

Fruit Quality and Potential Uses

FHIA-18 is a sweet-acid-tasting dessert type banana. It ripens naturally to a golden yellow color. It has commercial potential processing into banana puree because of its slow oxidation of the pulp.

FHIA-21

FHIA-21 Facts

Agronomic Characters	FHIA-21
Plant height (cm)	316
Pseudostem girth (cm)	54
Days to flowering	309
Days to harvest	436
Days from flowering to harvest	128
Bunch weight (kg)	17
Number of hands per bunch	7
Number of fruits per bunch	93
Fruit weight (g)	162
Fruit length (mm)	182
Fruit width (mm)	37
Fruit thickness (mm)	39
Fruit shape	straight
Mature fruit peel color	yellow
Flesh weight (g)	123
Pulp color at maturity	yellow
Flesh texture	soft
Edible portion (%)	76
Predominant taste	sweet/astringent
Pulp TSS (˚Brix)	24

FHIA-21 is resistant to black sigatoka leaf spot and can tolerate high nematode population in the soil. It is highly acceptable for processing into chips.

FHIA-21 is a hybrid between French Plantain cv. AVP-67 and SH 3142. The French type hybrid was developed by FHIA in Honduras. The cultivar grows well at elevations from 0 to 1,200 meters above sea level. Well-drained loamy soil is recommended, although FHIA-21 grows well in both heavy or light soil types, as long as moisture and nutrient levels are adequate.

Reaction to Diseases

The cultivar is moderately resistant to BBTD, and resistant to black sigatoka leaf spot disease. It can be grown with considerably less fungicide than that required to control this disease on current banana commercial plantations. This cultivar is the first known bred plantain that has disease resistance and fruit quality characteristics that make it suitable for large-scale cultivation. The cultivar can tolerate high nematode population.

Fruit Quality and Potential Uses

FHIA-21 is mainly consumed boiled or fried as chips, and is highly acceptable for chips processing as the fruits have favorable form, texture, color, and taste. The pulp also absorbs less oil and remains crisp at a longer time in ambient conditions. When ripe, the fruits are good for banana-flavoured pastries, and when over-ripe, good for making marmalade and liqueurs.

The fruits of FHIA-21 are straight and the peel of the green fruit turns to yellow when left to ripen under ambient conditions even without ethylene treatment.

FHIA-23

FHIA-23 Facts

Agronomic Characters	FHIA-23
Plant height (cm)	306
Pseudostem girth (cm)	66
Days to flowering	253
Days to harvest	449
Days from flowering to harvest	96
Bunch weight (kg)	32
Number of hands per bunch	11
Number of fruits per bunch	218
Fruit weight (g)	121
Fruit length (mm)	148
Fruit width (mm)	35
Fruit thickness (mm)	36
Fruit shape	straight
Mature fruit peel color	yellow
Flesh weight (g)	86
Pulp color at maturity	ivory
Flesh texture	soft
Edible portion (%)	71
Predominant taste	sweet
Pulp TSS (˚Brix)	18

FHIA-23 is a dessert cultivar that is resistant to Race 1 of *Foc.* Its sweet and soft pulp makes for good dessert, raw or processed.

FHIA-23 is a hybrid of Gros Michel cv. Highgate and SH 3362. It is extensively cultivated in Cuba where it is twice as productive as the cultivar Cavendish when no fungicides are used. It is generally considered as a table banana due to its good eating qualities. Additionally, among the FHIA cultivars, the FHIA-23 has the shortest flowering-to-harvest period.

Reaction to Diseases

Findings of disease resistance trials conducted by the Institute of Plant Breeding, University of the Philippines Los Baños (IPB-UPLB) show that FHIA-23 is moderately resistant to the BBTD and resistant to Race 1 of *Foc*. The variety can tolerate high nematode population.

Fruit Quality and Potential Uses

FHIA-23 is preferred as honey-coated and salted banana chips over their local counterparts, showing its potential in the processing industry, particularly in the production of export quality banana chips.

FHIA-23 produces fruits that are sweet, soft and with an ivory-colored pulp at maturity. Based on the performance and sensory evaluation studies by IPB-UPLB, FHIA-23, along with FHIAs 17, 21 and 25, produce heavier bunches than the heaviest yielding local cultivars (Cavendish and Cardaba).

FHIA-25

FHIA-25 Facts

Agronomic Characters	FHIA-25
Plant height (cm)	306
Pseudostem girth (cm)	68
Days to flowering	380
Days to harvest	521
Days from flowering to harvest	141
Bunch weight (kg)	47
Number of hands per bunch	15
Number of fruits per bunch	278
Fruit weight (g)	144
Fruit length (mm)	171
Fruit width (mm)	38
Fruit thickness (mm)	39
Fruit shape	slightly curved
Mature fruit peel color	Bright yellow
Flesh weight (g)	103
Pulp color at maturity	cream
Flesh texture	soft
Edible portion (%)	72
Predominant taste	sweet
Pulp TSS (˚Brix)	20

FHIA-25 is a dwarf plant with strong root system. It performs well in marginal soil and water conditions. It typically produces large bunch sizes that frequently weighs up to 45kg.

FHIA-25 is a hybrid of SH 3648 and SH 3142 developed by FHIA in Honduras. This hybrid is mainly a cooking-type banana plant. Yield evaluation conducted by IPB-UPLB showed that this cultivar, along with FHIAs 17, 21 and 23, produce heavier bunches than the highest yielding local Cavendish and Cardaba varieties.

Reaction to Diseases

FHIA-25 is moderately resistant to BBTD, and highly resistant to black sigatoka. These plant characteristics make FHIA-25 suited for cultivation as green cooking banana in areas where black sigatoka has previously been reported. The variety can also tolerate high nematode population.

Fruit Quality and Potential Uses

When mature, the fruit of FHIA-25 has a cream-colored pulp that is soft and sweet. When boiled unripe, the fruit has very good flavor and texture, as well as when fried (in thin slices). Additionally, based on sensory evaluation, FHIA-25 is favored when processed into salted banana chips. It is easy to peel and exudes very little latex. The harvested mature green fruit has long green life, and ripe fruit has bland taste.

Cachaco

Cachaco Facts

Agronomic Characters	Cachaco
Plant height (cm)	355
Pseudostem girth (cm)	47
Days to flowering	330
Days to harvest	451
Days from flowering to harvest	121
Bunch weight (kg)	12
Number of hands per bunch	5
Number of fruits per bunch	51
Fruit weight (g)	162
Fruit length (mm)	137
Fruit width (mm)	43
Fruit thickness (mm)	50
Fruit shape	straight in the distal
Mature fruit peel color	yellow
Flesh weight (g)	92
Pulp color at maturity	white
Flesh texture	soft
Edible portion (%)	56 (seeds present)
Predominant taste	Astringent
Pulp TSS (˚Brix)	22

Cachaco is a dual purpose banana, suitable for cooking and as fresh fruit dessert.

This is a farmer's cultivar belonging to ABB Bluggoe-type of bananas. Cachaco is a long maturing, tall cultivar, which bears heavy individual fingers with less sweet pulp.

Reaction to Diseases

This variety is resistant to BBTD but susceptible to Race 2 of *Foc* , the causal organism of Fusarium wilt.

CRBP 39

CRBP 39 Facts

Agronomic Characters	CRBP39
Plant height (cm)	292
Pseudostem girth (cm)	52
Days to flowering	338
Days to harvest	441
Days from flowering to harvest	103
Bunch weight (kg)	12.3
Number of hands per bunch	6
Number of fruits per bunch	81
Fruit weight (g)	150
Fruit length (mm)	124
Fruit width (mm)	23
Fruit thickness (mm)	25
Fruit shape	Curved in S shape
Mature fruit peel color	yellow
Flesh weight (g)	104
Pulp color at maturity	yellow
Flesh texture	firm
Edible portion (%)	69
Predominant taste	sweet
Pulp TSS (˚Brix)	28

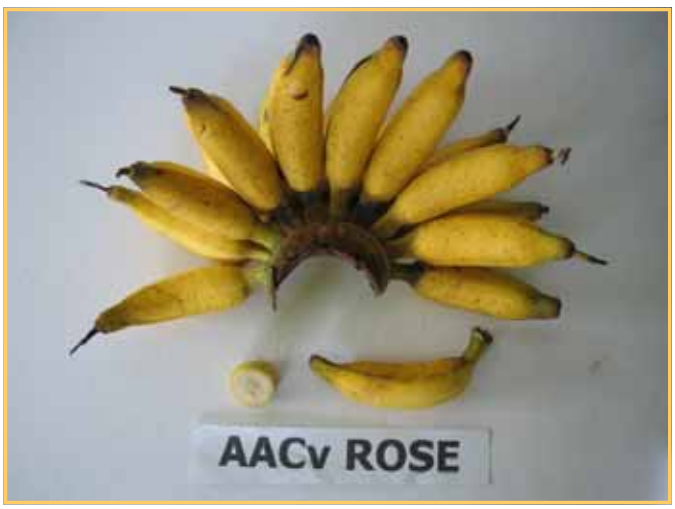
CRBP 39 is a cooking cultivar

CRBP 39 is a hybrid between Plantain cv. French Clair and M53 (4x). This cultivar is long maturing, has intermediate height, and bears heavy, elongated, curved and sweet individual fingers.

Reaction to Diseases

This cultivar is resistant to BBTD but highly resistant to black leaf streak disease.

Cv. Rose



Cv. Rose Facts

Agronomic Characters	Cv. Rose
Plant height (cm)	243
Pseudostem girth (cm)	38
Days to flowering	181
Days to harvest	303
Days from flowering to harvest	122
Bunch weight (kg)	5
Number of hands per bunch	8
Number of fruits per bunch	106
Fruit weight (g)	33
Fruit length (mm)	88
Fruit width (mm)	25
Fruit thickness (mm)	25
Fruit shape	straight in the distal part
Mature fruit peel color	yellow
Flesh weight (g)	25
Pulp color at maturity	yellow
Flesh texture	firm
Edible portion (%)	74
Predominant taste	sweet
Pulp TSS (˚Brix)	24

Cv. Rose is a table cultivar. It is a dwarf plant that produces small but sweet fruits.

Cv. Rose is a short cultivar, with short maturity period. It produces low yield with small fruits with intermediate sweetness of the pulp.

Reaction to Diseases

This cultivar is moderately resistant to BBTD and resistant to Fusarium wilt. It is however susceptible to root-knot nematode.

GCTCV-119

GCTCV-119 Facts

Agronomic Characters	GCTCV-119
Plant height (cm)	213
Pseudostem girth (cm)	38
Days to flowering	311
Days to harvest	409
Days from flowering to harvest	98
Bunch weight (kg)	10
Number of hands per bunch	5
Number of fruits per bunch	73
Fruit weight (g)	127
Fruit length (mm)	147
Fruit width (mm)	38
Fruit thickness (mm)	35
Fruit shape	curved
Mature fruit peel color	yellow green
Flesh weight (g)	92
Pulp color at maturity	cream
Flesh texture	firm
Edible portion (%)	79
Predominant taste	sweet
Pulp TSS (˚Brix)	24

GCTCV-119 is dessert cultivar, and is tall with short fruit stalks. It is resistant to Race 4 of *Foc*, and to nematodes.

Giant Cavendish Tissue Culture Variant 119 (GCTCV-119) is developed by the Taiwan Banana Research Institute (TBRI). It is a tissue culture somaclonal variant. This cultivar has improved agronomic characteristics and produces bigger bunches than the common Cavendish cultivar. The plant is very tall, has wavy leaves, short fruit stalk, and long growth cycle.

Reaction to Diseases

The cultivar is moderately susceptible to BBTD, but is highly resistant to Race 4 of *Foc.*

Fruit Quality

GCTCV 119 is a table-type banana. Its fruits are sweeter, with more starchy texture and darker shiny color on peel compared to the ordinary Cavendish. Generally, the fruit is acceptable because of its good pulp taste and flavor. The cultivar has fewer hands but with larger fingers. Pulp is firm and its color is cream at maturity.

Gros Michel

Gros Michel Facts

Agronomic Characters	Gros Michel
Plant height (cm)	307
Pseudostem girth (cm)	50
Days to flowering	366
Days to harvest	475
Days from flowering to harvest	108
Bunch weight (kg)	17
Number of hands per bunch	7
Number of fruits per bunch	103
Fruit weight (g)	135
Fruit length (mm)	147
Fruit width (mm)	38
Fruit thickness (mm)	38
Fruit shape	straight
Mature fruit peel color	yellow
Flesh weight (g)	95
Pulp color at maturity	yellow
Flesh texture	soft
Edible portion (%)	71
Predominant taste	mild
Pulp TSS (˚Brix)	21

Gros Michel is a popular export cultivar It produces massive bunches of large, flavorful fruit that are resistant to mechanical damage, making it suitable for shipping.

This table type cultivar is especially suitable for export to non-tropical countries such as the United States. Shipping this cultivar requires less care in packaging, climate control, or date stamping than the now common Cavendish banana because of its relatively thick skin.

Reaction to Diseases

Gros Michel is moderately resistant to BBTD and nematodes, but highly susceptible to Panama (Fusarium) disease. Gros Michel, however, is extremely susceptible to Race 1 of *Foc.*

Fruit Quality

The fruit of the cultivar is preferred because of the sweetness of the pulp. It has a soft texture and its fingers usually fall from the hands at ripe stage.

Pisang Ceylan

Pisang Ceylan Facts

Pisang Ceylan, also known as Pisang Keling, is a dessert type primitive cultivar. The vigorous plant is tall and is commonly used as a partially-resistant reference clone against fusarium wilt.

Agronomic Characters	Pisang Ceylan
Plant height (cm)	365
Pseudostem girth (cm)	64
Days to flowering	267
Days to harvest	365
Days from flowering to harvest	98
Bunch weight (kg)	17
Number of hands per bunch	11
Number of fruits per bunch	181
Fruit weight (g)	70
Fruit length (mm)	97
Fruit width (mm)	35
Fruit thickness (mm)	35
Fruit shape	straight
Mature fruit peel color	yellow
Flesh weight (g)	55
Pulp color at maturity	yellow
Flesh texture	soft
Edible portion (%)	79
Predominant taste	sweet
Pulp TSS (˚Brix)	21

Reaction to Diseases

The cultivar is resistant to BBTD, Race 1 of *Foc,* and sigatoka diseases. It is however, highly susceptible to the root-knot nematode, *Meloidogyne incognita*.

Fruit Quality

Pisang Ceylan is a table-type banana, and is silk type with round fruits. The fingers are persistent and do not easily fall off from the hand. The fruit peel is yellow at mature stage, peels off easily, the flesh is yellow when ripe, and the pulp has sweet predominant taste.

Pisang Jari Buaya

Pisang Jari Buaya Facts

Pisang Jari Buaya is table type banana. This hardy cultivar grows to more than 3m. Although it produces edible fruits, this cultivar is also of major interest for breeding due to its resistance to major diseases.

Agronomic Characters	Pisang Jari Buaya
Plant height (cm)	316
Pseudostem girth (cm)	38
Days to flowering	280
Days to harvest	372
Days from flowering to harvest	92
Bunch weight (kg)	10
Number of hands per bunch	8
Number of fruits per bunch	128
Fruit weight (g)	70
Fruit length (mm)	135
Fruit width (mm)	30
Fruit thickness (mm)	30
Fruit shape	straight in the distal part
Mature fruit peel color	bright yellow
Flesh weight (g)	50
Pulp color at maturity	yellow
Flesh texture	firm
Edible portion (%)	72
Predominant taste	sweet/acidic
Pulp TSS (˚Brix)	25

Reaction to Diseases

The cultivar is moderately susceptible to BBTD, and is resistant to the burrowing nematode, *R. similis* - the most wide-spread, damaging nematode associated with bananas. To date, Pisang Jari Buaya and Yangambi Km5 are the only sources of resistance to the burrowing nematode.

Fruit Quality

Pisang Jari Buaya produces acceptable fruits. The fruit peel is bright yellow when ripe and peels easily. The fingers of the cultivar are persistent and do not fall from hands. The fruit is slender and long with a unique sub-acid to sweet taste.

SH 3436-9

SH 3436-9 Facts

Agronomic Characters	SH 3436-9
Plant height (cm)	372
Pseudostem girth (cm)	65
Days to flowering	397
Days to harvest	112
Days from flowering to harvest	509
Bunch weight (kg)	20
Number of hands per bunch	8
Number of fruits per bunch	128
Fruit weight (g)	129
Fruit length (mm)	142
Fruit width (mm)	38
Fruit thickness (mm)	39
Fruit shape	straight
Mature fruit peel color	yellow
Flesh weight (g)	96
Pulp color at maturity	yellow
Flesh texture	soft
Edible portion (%)	75
Predominant taste	slightly tasty
Pulp TSS (˚Brix)	21

SH 3436-9 is a dual purpose cultivar. This hardy cultivar grows to more than 3m. This cultivar is also of major interest for breeding due to its resistance to diseases.

SH3436-9 is a dual purpose cultivar, which means it can be consumed as table-type and processed. It is a somaclonal variant of SH 3436 (Highgate x SH3142). It has a robust appearance and high yield that ranges from 13 to 80 kg. This hardy cultivar grows to more than 3m and has a drooping leaf habit.

Reaction to Diseases

This cultivar is susceptible to BBTD and root-knot nematode, *M. incognita.*

Fruit Quality

SH3436-9 is used for cooking and fresh fruit dessert because of its sweet taste when ripe. The fruit peel is yellow when ripe and peels off easily. The fingers of the cultivar are persistent and do not easily fall from hands.

SH 3640

SH 3640 Facts

Agronomic Characters	SH 3640
Plant height (cm)	278
Pseudostem girth (cm)	57
Days to flowering	280
Days to harvest	380
Days from flowering to harvest	100
Bunch weight (kg)	18
Number of hands per bunch	7
Number of fruits per bunch	90
Fruit weight (g)	156
Fruit length (mm)	154
Fruit width (mm)	42
Fruit thickness (mm)	41
Fruit shape	straight in the distal part
Mature fruit peel color	yellow
Flesh weight (g)	111
Pulp color at maturity	cream
Flesh texture	soft
Edible portion (%)	71
Predominant taste	sweet/acidic
Pulp TSS (˚Brix)	21

This is a table-type cultivar that grows to about 3m, is black leaf streak tolerant, and has sweet-acidic taste.

SH 3640 is a dessert type hybrid cultivar developed in Honduras, a hybrid between Dwarf Prata and SH 3393. It is a relatively short plant (about 2.75 m high) with short cycle, producing heavy bunch with very large fruits.

Reaction to Diseases

This cultivar is moderately resistant to BBTD and nematodes but tolerant to black leaf streak.

Fruit Quality

The fruit is table type with cream-colored pulp when ripe. The flesh is soft with sweet-acidic taste. Fruits are persistent, and fingers do not fall off from the hand.

TMBx 1378

TMBx 1378 Facts

Agronomic Characters	TMBx 1378
Plant height (cm)	348
Pseudostem girth (cm)	66
Days to flowering	367
Days to harvest	513
Days from flowering to harvest	147
Bunch weight (kg)	15
Number of hands per bunch	7
Number of fruits per bunch	123
Fruit weight (g)	86
Fruit length (mm)	94
Fruit width (mm)	36
Fruit thickness (mm)	40
Fruit shape	straight
Mature fruit peel color	yellow
Flesh weight (g)	64
Pulp color at maturity	yellow
Flesh texture	firm
Edible portion (%)	75
Predominant taste	sweet
Pulp TSS (˚Brix)	24

It is a cooking cultivar suitable for brewing. It tastes like the local cultivar, *Lagkitan*.

This cultivar is a hybrid between Pisang Awak cv. Fougamou and *M. balbisiana* (1-63). This is a cooking type cultivar, which grows tall to more than 3m, and has long crop cycles. It produces fruits similar to our local cultivar, “Lagkitan.”

Reaction to Diseases

This cultivar is resistant to BBTD, and black sigatoka diseases, but highly susceptible to Race 1 of *Foc*.

Fruit Quality

The fruit is suitable for brewing. The peel is yellow when ripe and peels off easily. The fruit sometimes produce few seeds. The fingers of the cultivar are persistent and do not easily fall from hands.

TMBx 5295-1

TMBx 5295-1 Facts

Agronomic Characters	TMBx 5295-1
Plant height (cm)	329
Pseudostem girth (cm)	54
Days to flowering	411
Days to harvest	519
Days from flowering to harvest	108
Bunch weight (kg)	18
Number of hands per bunch	7
Number of fruits per bunch	86
Fruit weight (g)	210
Fruit length (mm)	201
Fruit width (mm)	43
Fruit thickness (mm)	41
Fruit shape	curved
Mature fruit peel color	yellow
Flesh weight (g)	151
Pulp color at maturity	yellow
Flesh texture	soft
Edible portion (%)	72
Predominant taste	sweet/acidic
Pulp TSS (˚Brix)	23

This is a tall, cooking type cultivar, which is tolerant to black sigatoka.

This is a cooking banana hybrid between Laknau and Tjau lagada. This cultivar is also known as BITA-03, grows tall to more than 3m, and bears heavy bunches. It also has a long crop cycle.

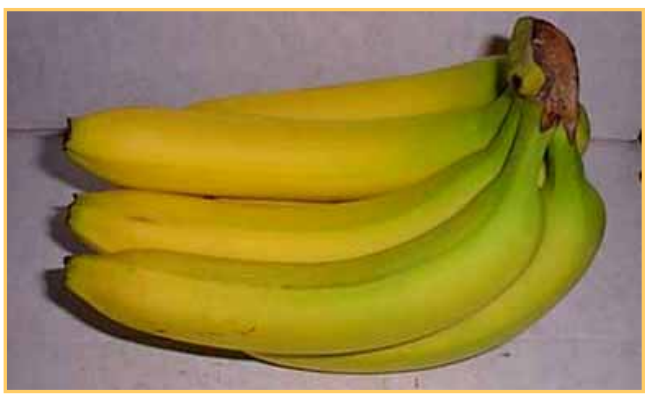
Reaction to Diseases

This cultivar is resistant to BBTD but susceptible to root-knot nematode, *M. incognita.*

Fruit Quality

The fruits produced are very large (over 200g per fruit) and peel is yellow when ripe and peels off easily. The fingers are persistent and do not easily fall from hand.

Tall Williams Cavendish



Williams Facts

Agronomic Characters	Williams*
Plant height (cm)	206
Pseudostem girth (cm)	56
Days to flowering	244
Days to harvest	345
Days from flowering to harvest	101
Bunch weight (kg)	16
Number of hands per bunch	8
Number of fruits per bunch	140
Fruit weight (g)	95
Fruit length (mm)	124
Fruit width (mm)	34
Fruit thickness (mm)	34
Fruit shape	curved
Mature fruit peel color	bright yellow
Flesh weight (g)	67
Pulp color at maturity	yellow
Flesh texture	soft
Edible portion (%)	68
Predominant taste	sweet
Pulp TSS (˚Brix)	19

* data for Dwarf Williams

This is a table type cultivar that is commercially grown in many countries, and is a preferred cultivar for export.

The cultivar Williams is a dwarf Cavendish mutant from Queensland, Australia. It is commercially grown in many banana growing countries. It produces large-sized fruit with excellent flavor and is preferred in the export market. It is a hardy plant and is tolerant to cold weather.

Reaction to Diseases

This cultivar is moderately resistant to BBTD but susceptible to sigatoka diseases, and Race 4 of *Foc.*

Fruit Quality

The fruit is a table-type, with excellent flavor, and is highly preferred in the international market. Peel of the fruit turns bright yellow when ripe; fruit peels easily. Pulp is soft and yellow when ripe; predominant taste is sweet.

Yangambi Km5

Yangambi Km5 Facts

Agronomic Characters	Yangambi Km5
Plant height (cm)	319
Pseudostem girth (cm)	55
Days to flowering	430
Days to harvest	571
Days from flowering to harvest	141
Bunch weight (kg)	8.42
Number of hands per bunch	7
Number of fruits per bunch	148
Fruit weight (g)	40.67
Fruit length (mm)	72.75
Fruit width (mm)	28.38
Fruit thickness (mm)	31.59
Fruit shape	straight
Mature fruit peel color	yellow
Flesh weight (g)	30.57
Pulp color at maturity	yellow
Flesh texture	firm
Edible portion	75.16
Predominant taste	sweet
Pulp TSS (˚Brix)	24.23

This cultivar is a tall plant that produces small, table-type banana. It is resistant to fusarium wilt, and sigatoka leaf spot.

Yangambi Km5 is a primitive cultivar originally from West Central Africa. The cultivar is also known as 'Ibota', which means "many small fruits". It is tall, erect, and sturdy with light green external pseudostem.

Reaction to Diseases

The cultivar is moderately resistant to BBTD, and highly resistant to fusarium wilt, black leaf streak and sigatoka diseases. Yangambi Km5 is resistant to the burrowing nematode, *R. similis.*

Fruit Quality and Potential Uses

The fruit of Yangambi Km5 is an excellent tasting table banana. The fruit is round with yellow peel color at maturity. The fruit peels off easily and the pulp is yellow when ripe. The flesh is firm with sweet to slightly acidic taste.

Local Cultivars

Popular cultivars in the Philippines were evaluated and included in this handbook.

These cultivars are currently conserved as foundation stocks in green-houses, and *in-vitro* materials at the National Repository, Multiplication, and Distribution Centre (NRMDC) -Crop Science Cluster at the Institute of Plant Breeding-University of the Philippines Los Baños (CSC-IPB-UPLB).

Buñgulan

Buñgulan Facts

Agronomic Characters	Bungulan
Plant height (cm)	268
Pseudostem girth (cm)	41
Days to flowering	298
Days to harvest	404
Days from flowering to harvest	106
Bunch weight (kg)	14
Number of hands per bunch	6
Number of fruits per bunch	103
Fruit weight (g)	124
Fruit length (mm)	145
Fruit width (mm)	36
Fruit thickness (mm)	41
Fruit shape	straight in the distal part
Mature fruit peel color	Bright yellow
Flesh weight (g)	91
Pulp color at maturity	ivory
Flesh texture	soft
Edible portion (%)	74
Predominant taste	sweet
Pulp TSS (˚Brix)	21

This is a popular dessert cultivar, and is produced mainly in small-hold backyard plantings. *Buñgulan* is the best cultivar used in making banana cake.

This cultivar is also locally known as *Buñguran* in Bicol, *Buluñgan* in Cebu, and *Balañgon* in Negros Occidental and Iloilo.

Reaction to Diseases

This cultivar exhibits moderate resistance to BBTD under experimental conditions as shown by the late onset of infection in mother plants, however, ratoons show characteristic symptoms of the disease. It is susceptible to nematodes.

Fruit Quality

The pulp is pale orange-yellow when ripe, which may be associated with a high Vitamin A content. It is sweet and aromatic, and is of excellent eating quality. The peel color is yellow-green when ripe and pulp is sweet, is very aromatic, and has a unique flavor.

Cardaba (Saba sub-group)

Cardaba Facts

This is the most popular variety for processing of banana chips in the domestic and export markets. It is commonly used in the preparation of snack foods like banana-cue. It is sturdy to drought and other common biological stresses.

Agronomic Characters	Cardaba
Plant height (cm)	401
Pseudostem girth (cm)	68
Days to flowering	339
Days to harvest	479
Days from flowering to harvest	141
Bunch weight (kg)	23
Number of hands per bunch	9
Number of fruits per bunch	150
Fruit weight (g)	129
Fruit length (mm)	110
Fruit width (mm)	42
Fruit thickness (mm)	50
Fruit shape	straight
Mature fruit peel color	yellow
Flesh weight (g)	78
Pulp color at maturity	cream
Flesh texture	firm
Edible portion (%)	60
Predominant taste	astringent
Pulp TSS (˚Brix)	25

Reaction to Diseases

This cultivar is highly resistant to BBTD, but prolonged exposure of ratoons to the disease reduces its resistance. It is also highly resistant to black sigatoka diseases, and is moderately resistant to nematodes. However, it is susceptible to the '*bugtok'* disease, which causes hardening of the fruit pulp and renders the pulp inedible. Bunches are debelled to prevent the fruits from infection.

Fruit Quality and Potential Uses

The mature pulp is sweet and edible even when uncooked. However, it tastes better when cooked. This cultivar can be cooked as *turon* (fried banana with starchy wrapper), banana cue (deep fried bananas coated with brown sugar), maruya (fried bananas with flour and butter). These are popular local snacks. The biggest potential of Cardaba, however, is as raw material for processing into chips. Among the local cultivars, the male bud (commonly known as *puso ng saging*) is used as vegetable prepared into several Filipino dishes. It can also be cooked, together with local dishes such as *kare-kare* and *pochero*. The leaves are distinctly preferred for food wrappings because of its scent and aroma.

Cardaba belongs to the Saba sub-group.

Saba (Saba sub-group)

Saba Facts

Agronomic Traits	Saba
Plant ht (cm)	450 - 500*
Pseudostem girth (at 1 m) (cm)	
Days to flowering (days)	
Flowering to harvest (days)	150-180**
Days to harvest	
Bunch wt (kg)	26 to 28*
Number of hands	9 to 11*
Number of fruits (per bunch)	162 to 198*
Fruit wt (grams)	105
Fruit lt (mm)	115
Fruit width (mm)	45
Fruit thickness (mm)	36
Fruit shape	straight
Mature fruit peel color	yellow
Flesh wt (grams)	67
Pulp color at maturity	cream
Fruit-fall from hands	persistent
Flsh texture	firm
Edible portion (%)	63.5
Predominant taste	sweet
Pulp TSS (˚Brix)	28.8

This is the most popular cooking and processing cultivar in Luzon. It is used to prepare popular snack foods while the male bud is used as vegetable

* Data from Valmayor (2002)
** Data from PCARRD (1992)

Saba is also known as *Dippig* in the Ilocos region. This cultivar is very similar to Cardaba, which is more popular in Visayas and Mindanao.

Reaction to Diseases

This cultivar is highly resistant to BBTD, but prolonged exposure of suckers to the disease reduces its resistance. It is also highly resistant to black sigatoka diseases, and is moderately resistant to nematodes. However, it is susceptible to '*bugtok'*, which causes hardening of the fruit pulp and renders the pulp inedible.

Fruit Quality and Potential Uses

This cultivar can be also be cooked into snack foods like *turon* (fried banana with starchy wrapper), banana cue (deep fried bananas coated with brown sugar), and maruya (fried bananas with flour and butter). The male bud (commonly known as *puso ng saging*) can be prepared into several Filipino dishes as well as ingredient to popular dishes like *kare-kare* and *pochero*. The leaves are distinctly preferred for food wrappings because of its scent and aroma.

Grand Naine Cavendish

Grand Naine (Cavendish) Facts

Agronomic Characters	Cavendish
Plant height (cm)	214
Pseudostem girth (cm)	45
Days to flowering	213
Days to harvest	307
Days from flowering to harvest	93
Bunch weight (kg)	23
Number of hands per bunch	8
Number of fruits per bunch	128
Fruit weight (g)	88
Fruit length (mm)	140
Fruit width (mm)	32
Fruit thickness (mm)	30
Fruit shape	curved
Mature fruit peel color	yellow
Flesh weight (g)	61
Pulp color at maturity	yellow
Flesh texture	soft
Edible portion (%)	69
Predominant taste	sweet
Pulp TSS (˚Brix)	21

This is the cultivar grown for the export market and for processing into other products such as ketchup, and flour.

It is the most common commercial variety of banana for export worldwide. It produces large bunches and fingers despite its relatively small stature of less than 3m. It is sensitive to drought and other adverse soil conditions, and may be grown in high-altitude locations due to its tolerance to strong winds.

Reaction to Diseases

This cultivar is moderately susceptible to BBTD, highly susceptible to black sigatoka disease, nematodes, and Tropical Race 4 of *Foc*.

Fruit Quality

The fruit is a table-type banana with yellow to bright green peel color at maturity. The fruit peels off easily from the pulp, which is yellow when ripe. The flesh is soft and the predominant taste is sweet. Cavendish fruits are persistent; fingers do not easily fall from hands.

Cuarenta Dias

Cuarenta Dias Facts

Agronomic Characters	Cuarenta Dias
Plant height (cm)	244
Pseudostem girth (cm)	42
Days to flowering	232
Days to harvest	279
Days from flowering to harvest	48
Bunch weight (kg)	8
Number of hands per bunch	7
Number of fruits per bunch	110
Fruit weight (g)	55
Fruit length (mm)	86
Fruit width (mm)	33
Fruit thickness (mm)	33
Fruit shape	straight
Mature fruit peel color	yellow
Flesh weight (g)	45
Pulp color at maturity	yellow
Flesh texture	soft
Edible portion (%)	82
Predominant taste	mild to sweet
Pulp TSS (˚Brix)	20

This local cultivar is a popular table-type banana in Laguna and Cavite (particularly in Tagaytay). Flowering to harvest takes about 40 days.

It is locally known as *Arnibal* (meaning syrup) in Negros Occidental, *Monkoy* in Negros Oriental and Mansaka, *Señorita* in Laguna, *Surat-sut* in Bicol, *Cariñosa* in Abra, and *Lungsuranon* in Surigao. Cuarenta Dias is a Spanish phrase that literally translates to “40 days” - the number of days from removal of male bud to harvest. This cultivar is known in Malaysia as *Pisang Empat Puluh Hari* (Forty Days) and *Pisang Lampung* in Indonesia.

Reaction to Diseases

It is highly susceptible BBTD and sigatoka diseases, but moderately resistant to nematodes.

Fruit Quality

This cultivar popular for its sweet and aromatic fruits but they are small and weakly attached to the pedicel. It sells cheaper than the more common table-type cultivars.

Lagkitan

Lagkitan Facts

Agronomic Traits	Lagkitan
Plant ht (cm)	394
Pseudostem girth (at 1 m) (cm)	80
Days to flowering (days)	330*
Flowering to harvest (days)	130*
Days to harvest	450*
Bunch wt (kg)	9.89
Number of hands	7
Number of fruits (per bunch)	110
Fruit wt (grams)	115
Fruit lt (mm)	110
Fruit width (mm)	43
Fruit thickness (mm)	40
Fruit shape	slightly curved
Mature fruit peel color	yellow
Flesh wt (grams)	92
Pulp color at maturity	white
Fruit-fall from hands	decidous
Flsh texture	soft
Edible portion (%)	80%
Predominant taste	sweet
Pulp TSS (˚Brix)	25.4

* Data from Valmayor (2002)

This dual purpose local cultivar is popular in the Southern Tagalog region

Lagkitan is a dual purpose cultivar, consumed either fresh or cooked. It is locally known as *Katali* and *Botolan* in Palawan. It is likewise known as *Pisang Awak* in Malaysia and Indonesia, and as *Kluai Namwa Luang* in Thailand.

Fruit Quality

The fruit is sweet and has good flavor, and with excellent taste when roasted. It is usually seedless but some forms produced occasional few seeds

Lakatan

Lakatan (Davao) Facts

Agronomic Characters	Lakatan Davao
Plant height (cm)	307
Pseudostem girth (cm)	51
Days to flowering	289
Days to harvest	282
Days from flowering to harvest	93
Bunch weight (kg)	17
Number of hands per bunch	7
Number of fruits per bunch	116
Fruit weight (g)	113
Fruit length (mm)	135
Fruit width (mm)	34
Fruit thickness (mm)	41
Fruit shape	straight
Mature fruit peel color	orange
Flesh weight (g)	84
Pulp color at maturity	yellow
Flesh texture	firm
Edible portion (%)	74
Predominant taste	sweet
Pulp TSS (˚Brix)	26

This Lakatan accession originally came from a commercial tissue-culture laboratory in Davao, Philippines.

This Lakatan accession is being distributed by commercial tissue-culture laboratories based in Davao. It is the most widely grown Lakatan accession in the Philippines, both in smallhold and commercial farms.

Reaction to Diseases

It is highly susceptible to BBTD, sigatoka diseases, and nematodes. However, this can be controlled by using tissue-culture derived planting materials, annual cropping, eradication of diseased plants and control of the aphid vector, *Pentalonia nigronervosa*.

Fruit Quality

It bears large fruits. The pulp is pale orange-yellow when ripe, which is associated with high Vitamin A content. It is sweet and aromatic and is of excellent eating quality.

Latundan

Latundan Facts

Agronomic Traits	Latundan
Plant ht (cm)	339
Pseudostem girth (at 1 m) (cm)	60
Days to flowering (days)	259
Flowering to harvest (days)	95
Days to harvest	354
Bunch wt (kg)	12.39
Number of hands	7
Number of fruits (per bunch)	101
Fruit wt (grams)	91 g
Fruit lt (mm)	138
Fruit width (mm)	34
Fruit thickness (mm)	35
Fruit shape	curved
Mature fruit peel color	yellow
Flesh wt (grams)	72
Pulp color at maturity	cream
Fruit-fall from hands	persistent
Flsh texture	firm
Edible portion (%)	80%
Predominant taste	sweet
Pulp TSS (˚Brix)	27

This cultivar is a popular table banana that is small to medium in size and has white pulp and yellow peel. It is sweet with mild sub-acid taste, fine texture, and sweet and delicious flavor.

Reaction to Diseases

Latundan is highly susceptible to Race 1 of *Foc*, and sigatoka. It is susceptible to nematodes, *R. similis* and *M. incognita*.

Fruit Uses

Latundan is common in local markets, and is fed to infants due to its easy digestability. Bananas with freckles (small brown to black spots), like Latundan, are preferred by consumers because it's associated with sweetness.

Guide to common banana diseases

Banana Bunchy Top

Symptoms:

leaf narrowing & reduction in surface area, marginal chlorosis, dark green streaks on minor veins, vein clearing

stunted & erect growth, rosetting, progressive shortening & bunching on top of leaves

bunch stalk are distorted & fruits are small

Bugtok

Symptoms:

dry or gelatinous greyish black or yellowish red tissues may be found and this may extend to the entire pulp

Reddish brown vascular discoloration extends upwards from the male flower, but is rarely visible beyond the peduncle.

Fusarium wilt

Symptoms:

chlorosis that starts from the leaves

dark brown discoloration on vascular tissues as shown in cross sections of pseudostem

pseudostem splitting

Other banana diseases

Black Sigatoka

Banana Mosaic

Black Cross

Cordana Leaf Spot

Freckle

Root Knot

Guide to common banana insect pests

Banana Brown Aphid

They are piercing/sucking insects. They can be found in all areas where bananas are grown. They can multiply and reproduce in other host plants.

Mealybugs

High infestation is observed on the fruits, pseudostem, leaves and roots during summer months and when plants are grown under large fruit trees. Mealybugs have always been associated with sooty mold since they produce honey dew as substrate of fungus on leaves resulting to unsightly appearance.

Thrips

Most destructive on leaves, flowers and young fruits. Young thrips has a whitish-yellow larva with no distinct body region at the early stage. Adults are small and colored yellow.

Corm Weevil

Larva has a reddish brown head with soft, creamy white body. Mostly found in soil. Adult is reddish brown turning black with dark brown snout, 15 cm long.

Mites

Most destructive on leaves, flowers and young fruits. Young thrips have a whitish-yellow larva with no distinct body region at the early stage. Adults are small and colored yellow.

Leaf Roller

Larva tends to ripped off the foliage as it rolls in the lower leaf surface. More than one larvae can infest one leaf.

Glossary of Terms

Cooking type – starchy bananas used for cooking and are commonly not preferred to be eaten raw

Debelling – removal of the male flower/ bud after the emergence of the last hand

Dessert type – these are soft and sweet bananas suitable to be eaten raw

Green life – the mature unripe stage of the banana fruit

Hybrid – the result of breeding between two cultivars or species

Mother Plant - the first plant crop

Plantain – a species of the genus *Musa that is starchy, low in sugar variety and is generally used for cooking as it is unsuitable raw, in contrast to the soft, sweet dessert banana*

Propping – support to a banana plant when the bunch is too heavy; the support may be wooden or bamboo poles or cables to prevent the plants from breaking, bending or toppling down

Ratoon – A shoot sprouting from the root of a cropped plant; the plant crop after the mother plant

Resistant – A plant having qualities that retard the activities of a pathogen or insect pest

Susceptible – The characteristic of an organism described as the inability to suppress or retard an injurious pathogen.

Total Soluble Solids – an index of soluble solids concentration in the fruit. The index is also a measure of the degree of sweetness

Abbreviations

BBTD – Banana bunchy top disease

BBTV – Banana bunchy top virus

CA – College of Agriculture

CIRAD— Agricultural Research Centre for International Development

CSC—Crop Science Cluster

FHIA – Fundacion Hondureña de Investigacion Agricola

Foc— *Fusarium oxysporum f.sp. cubense*

IITA— International Institute of Tropical Agriculture

INIBAP – International Network for the Improvement of Banana and Plantains

IPB – Institute of Plant Breeding

NPGRL – National Plant Genetic Resources Laboratory

NRMDC – National Repository, Multiplication and Distribution Center

TBRI – Taiwan Banana Research Institute

TSS – Total Soluble Solids

UPLB – University of the Philippines Los Baños

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