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ALLOWED GEOGRAPHICAL INDICATION PUBLISHED FOR THIRD-PARTY OBSERVATION

1.1 Allowed Geographical Indication

No.	Application Number	Filing Date	Geographical Indication	Applicant	Goods
1	G/4/2023/00001	20 November 2022	GUIMARAS MANGO	Guimaras Mango Growers and Producers Development Cooperative	Fresh Mangoes

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Application No:	G/4/2023/00001
Geographical Indication:	**GUIMARAS MANGO**
Filing date:	20 November 2022
Applicant(s):	Guimaras Mango Growers and Producers Development Cooperative
Address:	Sittio Talangban, Millan, Sibunag, Guimaras
Goods:	Fresh Mangoes
Geographical Area:	Entire island province of Guimaras, consisting of the 5 municipalities namely, Jordan, Buenavista, San Lorenzo, Sibunag and Nueva Valencia
Disclaimer/s:	Mango
Quality, Characteristics, or Reputation	Produced exclusively in the island province of Guimaras, Guimaras mango is a typical "carabao" variety mango which is shaped like an ellipsoid, with a rounded crown and an oblong end. It has a green color when unripe and changes into yellow-orange to yellow color as it ripens. Its flesh is meaty, smooth, firm, juicy and non-fibrous. The size of the total blemishes found on the skin of the Guimaras mango shall not exceed 10% of the total fruit surface. Guimaras mango is also known as the "sweetest mango" due to its sweetness which ranges from 16-degree Brix and higher. It also has "*marabo*" texture, a Guimarasnon word meaning a distinct blend of crunchiness, sweetness and sourness. The quality and characteristics of Guimaras mango is attributed to the topography of Guimaras Island which varies from flat to steeply sloping, with land elevation ranging from 0 to nearly 300 meters above sea level. The moderately undulating and rolling to steeply sloping topography and elevation of the island is highly suited for growing "carabao" mangoes. Guimaras island has also combination of calcareous and loamy soils which contributes to the good quality of the Guimaras mango. The reputation of Guimaras as source of its famous mangoes was likewise established due to its mango festival known as "Manggahan Festival" celebrated during the month of May each year.

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CODE OF PRACTICE

Code of Practice

GUIMARAS MANGO GROWERS AND
PRODUCERS DEVELOPMENT COOPERATIVE (GMGPDC)

January 10, 2017

Submitted to:

International Property Office of the Philippines

(IPOPHL)

Acknowledgement

We, the collective group, Guimaras Mango Growers and Producers Development Cooperative (GMGPDC) would like to express our heartfelt gratitude to the many people who saw us through this Code of Practice; to all those who provided support, offered comments, and assisted in the editing, revision, proofreading to the following:

To the Provincial Government of Guimaras, who supports for this advocacy to distinguish the Guimaras Mangoes among others. To the Provincial Economic Development Office under the leadership of Miss Elena V. Quezon, EnP for her untiring support for the submission of this Code of Practice. To the Provincial Office of Agricultural Services, under the supervision of Mr. Ronnie Morante together with Madam Jojien Dicen for their technical support.

To the Bureau of Plant and Industry - Guimaras National Crop Research, Development Support Center (BPI-GNCRDSC) for their benevolent support for the cooperative in strict implementation of the best practices for the Guimaras Mangoes with the guidance of Mr. Yondre Yonder.

To the Department of Trade and Industry Guimaras Field Office (DTI-Guimaras) for helping us to push through this Code of Practice and connect us with the International Property of the Philippines (IPOPHL).

To our present fellow cooperative members and future ones, we may uphold the strict implementation of this Guimaras Mango Geographical Indication (GI) Seal to distinguish and preserve the sweetest mango in the Philippines.

Guimaras Mango Growers and Producers Development Cooperative

Table of Contents

Part I: Justification for the request for protection

I. Introduction

Guimaras is a well-known mango-producing province in the Philippines. Mangoes in Guimaras are very popular all over the world because of its very exotic taste. It has a unique sweetness, firm flesh, sweet-smelling aroma, thin seeds as well as peel (Eligio, 2017).

The GMGPDC (the collective group) intends to register the Guimaras Mango as a Geographical Indication (GI) with the Intellectual Property Office of the Philippines (IPOPHL). A geographical indication is a sign used on products that have a specific geographical origin and hold qualities or reputation that are due to that origin. Moreover, the qualities, characteristics or reputation of the product should be essentially due to the place of origin. There is a clear link between the product and its original place of production, since the qualities depend on the geographical place of production (WIPO, 2017). A GI registration is sought to protect the specific qualities of the Guimaras Mango that are linked to its geographical territory and to protect the reputation it has earned throughout the years. The specific qualities and their links to the natural conditions of the territory and/or to specific farm/production practices are as follows:

Quality

Philippine Mango is a tropical tree scientifically known as *Mangifera indica Lim*. Its fruit is a fleshy drupe, resinous, variable in shapes and dimensions, consisting of leathery peel, fleshy pulp and fibrous stone (DTI, 2004).

There are many known varieties of mangoes in the Philippines of which “Carabao” mango is one of them and Guimaras Mangoes belongs to this classification. “Carabao” Mango fruit is oblong which blunt apex, full cheeks and a rather indistinct beak. When ripe, the flesh is golden yellow, very tender with delicate, aromatic non-turpentine flavor, exquisite sub-acid taste (Dagoon, 2000). The fiber is medium coarse but confirmed coarse but confined almost entirely to the edges of the stone. The peel is smooth and bright yellow when ripe and has delicate aroma. “Carabao” mango is known in the international trade as “Philippine Super Mango”.

Mango fruits should meet the minimum requirements of Philippine National Standard for Philippine Mango, formulated by the Department of Agriculture – Bureau of Agriculture and Fisheries Product Standards. (See Annex 1 for the Philippine National Standard for Fresh Fruit Mangoes.)

- External quality also refers to fruit maturity harvested at right age pursuant to Provincial Ordinance No. 003, Series of 2011, an ordinance regulating the harvesting and sale of immature Mango Fruits intended for Table Ripe Consumption in the Province of Guimaras. (See Annex 2 for Provincial Ordinance No. 003, Series of 2011.)

- External quality is the lack of blemishes due to the fact that the island is free of mango seed and pulp weevil because of the strict sanitary and quarantine norms practiced over the years. The lack of blemishes and damage of fruit infesting insect pest is also attributed to the strict adherence to and the timing of production practices like planting, flower induction, and implementation of Integrated Cultural Management (ICM);

- Quality is having a good fruit appearance, smooth skin, yellow orange flesh color, firm flesh, good pulp consistency and good resistance to handling and transport, all attributable to the high level of calcium in the soil.

- Quality: Chemical and micro-biological hazards free due to strict implementation of Good Agricultural Practice (GAP) in the farm.

II. Reputation

On the other hand, the reputation of the Guimaras Mango is evidenced by the following:

- ❖ In the article published in MIN infonews 'Manila Super Mangoes' from Guimaras was exported to Australia. Mangoes were harvested and brought to Manila for postharvest treatment using vapor heat treatment (VHT), repacked and sent to Australia. MIN infonews is a quarterly publication of the Mango Information Network. (See Annex 3 for MIN infonews.)

- ❖ In the article published on Balita website dated June 27, 2012, Mr. Vizmindo Cuda, Vice-Chairman of the mango industry cluster and a Davao mango grower, expressed the plan of the cluster to

conduct a benchmarking trip to Guimaras, specifically to see first-hand how Guimaras produces mangoes with the highest export quality. According to him, Guimaras is a good model for the Davao mango growers to follow. (See Annex 4 for Balita webpage article.)

- There was an attempt to plant the seeded or grafted mango trees from Guimaras in a mango plantation elsewhere in the Philippines, but it did not produce the same quality.

- Television advertisement by Nestlé Philippines entitled Nestle Philippines TV Commercial: NESFRUTA "Amoyzing Master" published January 21, 2013 on national television where a child gets to blind taste a juice, and the child think it's a mango from Guimaras while in fact it is only a juice. (See Annex 5 for the screenshot of Nestle Nesfruta advertisement.)

- Guimaras mango known as the best mango in the Philippines by most consumers. People have come to associate Guimaras with mangoes, the island's most important agricultural crop and the country's export champion (See Annex 6 for article of The Philippine Star).

III. History

The presence of century old "Carabao" mango trees in the Province of Guimaras is a living evidence that the crop is endemic in the locality. One of the mother trees of Rosalinda Efondo at San Isidro Municipality of Sibunag, is over 100 year old the width of canopy about 18 meter and truck circumference of about size of 3 drums combined.

In terms of orchards type, the farm of Mrs. Gentugaya in Alaguisoc, Jordan have grafted "Carabao" mango tree with an estimated age of 70 years, the orchard is recommended for tree rehabilitation after it was awarded CARP beneficiaries. These are the scenario that indeed, mango farming is a century old activity in the province. (See Annex 7 for the Mango Tree Population.)

IV. Physical link to the territory

A. Topography and Slope

The topography of Guimaras Island varies from flat to steeply sloping, with land elevation ranging from 0 to nearly 300 meters above sea level. The moderately undulating and rolling to steeply sloping topography and elevation of the island is highly suited for growing "Carabao" mangoes. A slope range from 0%-30% (moderately sloping to rolling and strongly sloping to moderately steep) is an important factor for the successful growth and development of the mango trees. Mango trees in low lying areas with poor drainage and subjected to floods is prone to disease infection generally die quickly.

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B. Soil

The combination of calcareous and loamy soils contributes to the good quality of the Guimaras mango. Gravelly loam is the major soil type, comprising about 71.85% of the total land area of Guimaras. This is a residual soil from diuretic and basaltic rocks. Its surface soil is brown to grayish brown fine sandy loam to gravelly loam and structureless. Concretions are present and its depth is 20-25 centimeters. Its subsoil is light brown fine sand, slightly compact and structureless. Concretions and gravels are abundant and its depth is 25-80 centimeters from the surface. The mango tree has a very deep and strong root system, thus, a deep soil is ideal for easy penetration and spread of the root system. Deep and well-drained soils allow for good depth and distribution of the root system, producing trees of standard size, high yields and long life. Its substratum is dark brown fine sand, structureless, slightly compact and with gravels present. The presence of a substratum of loose gravel helps in providing good drainage.

The soil in the eastern and central part of the island is gravelly loam while on the western side the soil is clay loam. On the other hand, sandy loam soil is found in the northeast portion of Buenavista. At the same time, the soil where the trees are rooted is very abundant in nutrients which support the trees to produce fruits that are rich in flavour and nutrition. A soil that has a balanced mixture of loam, sand and, clay is the best soil for any kind of plant, according to experts. These are the qualities of Guimaras soil, and making it an ideal place to plant mango trees as well as other types of tropical fruits (Eligio, 2017).

Guimaras has a calcareous soil, abundant in calcium and magnesium and with a good drainage. Calcium is increasingly recognized as a key to mango production in terms of quality and yield. Mangoes with adequate amounts of calcium are firmer, have better appearance, have good skin color, and have better resistance to handling and transport. Pulp consistency during growth is better maintained with adequate amounts of calcium. A low calcium level and high nitrogen level leads to the collapse of the internal pulp resulting in a low quality mango.

The following figures of soil classification map and soil suitability map as shown on Figures 1 and 2 present that gravelly loam is the major soil type and seventy percent (70%) of the province's land is agro-edaphic suitable which is suitable for mango, respectively.

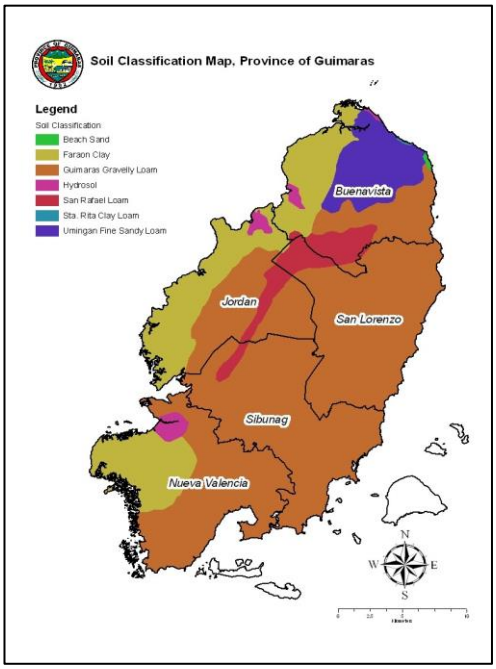

FIGURE 1. SOIL CLASSIFICATION MAP OF THE PROVINCE OF GUIMARAS

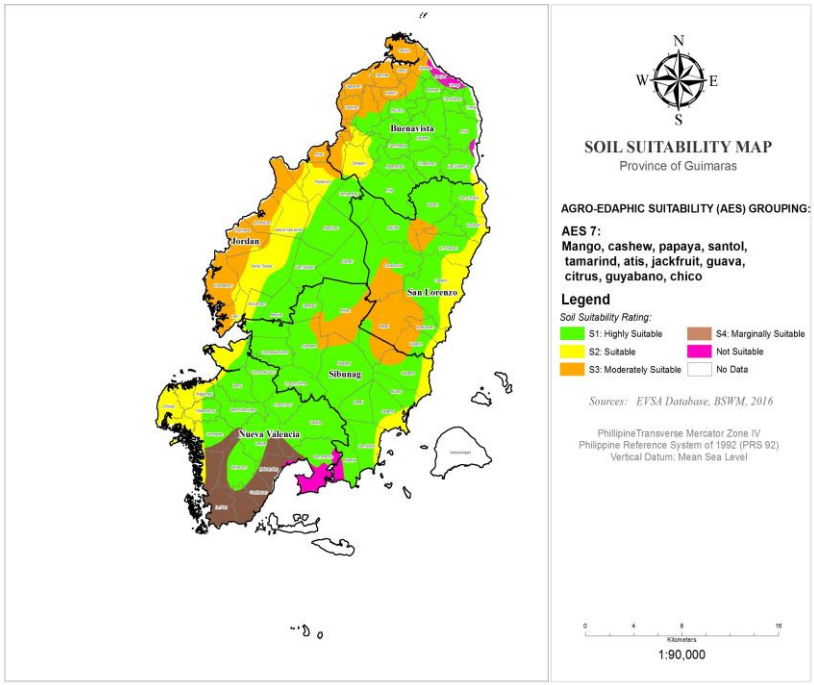

FIGURE 2. SOIL SUITABILITY MAP OF THE PROVINCE OF GUIMARAS

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C. Climate

The climate in Guimaras is classified as Corona Type I, with two distinct seasons: the dry season usually from November to April, and the wet or rainy season occurring during the months from May to October.

The latest data on the temperature in Guimaras show a minimum mean temperature of 23.0 °C recorded in February and a maximum mean temperature of 33.0 °C in April and May. Temperature plays a direct role in the flowering, fruit set and fruit development of mangoes. The temperature has to be within a clearly defined range to obtain mangoes of good quality. Guimaras is located in the Western Visayas Region; the climate in this area is not as humid as the other areas of the country. The climate as well as the location directly affects the quality of any fruits.

Rainy months are from May to October. The highest average rainfall was recorded in August with 363.7 millimeters while the lowest average rainfall was observed in February at 19.1 millimeters. It is not the quantum of rainfall but the timing which is important in the growing of mangoes. The absence of rain during the flowering period is a critical pre-requisite for the successful growing of mangoes. Rain at the flowering stage not only washes away the pollen, which adversely affects fruit set, but also encourages a high incidence of mango hoppers, mealy bugs and diseases like powdery mildew and anthracnose, which damages the mango sometimes completely. This also interferes with the activity of pollinating insects, thus adversely affecting fruit set.

“Amihan” refers to the season dominated by the trade winds, which are experienced as a cool northeast wind. It is characterized by moderate temperatures, with little or no rainfall, and a prevailing wind from the east. As a general rule of thumb, the “Amihan” weather pattern begins sometime in September or October and ends sometime in May or June. However, there may be wide variations from year to year. “Amihan” affects the municipality of Buenavista and its surrounding environs.

On the other hand, the “Habagat” season is characterized by hot and humid weather, frequent heavy rainfall, and a prevailing wind from the west or southwest. “Habagat” is also known as monsoon or southwest monsoon. “Habagat” affects the municipality of Nueva Valencia and surrounding municipalities.

V. Definition of the Geographical Area

The delimited territory (geographical area) of the Guimaras Mango encompasses the entire island province of Guimaras, consisting of the 5 municipalities: Jordan, Buenavista, San Lorenzo, Sibunag and Nueva Valencia.

VI. Organization

The following figure shows the organizational chart of the collective group, Guimaras Mango Growers and Producers Development Cooperative.

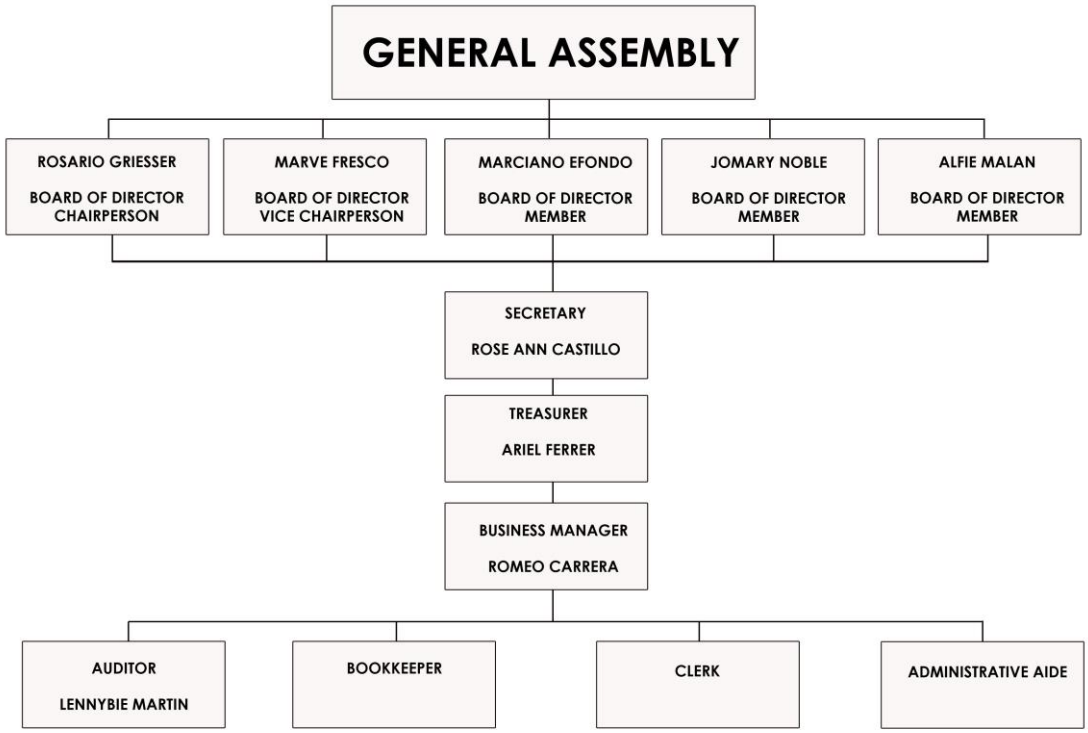


FIGURE 3. ORGANIZATIONAL CHART OF THE GUIMARAS MANGO GROWERS AND PRODUCERS DEVELOPMENT COOPERATIVE.

Part II: Technical Part

I. Description of the product

I.i. Fresh mango

The Guimaras Mango GI is the fresh mango whose color is green when unripe, then changes into a yellowish-orange to a yellow color as it ripens.

The Guimaras mango is a typical "Carabao" mango shaped like an ellipsoid, with a rounded crown and an oblong end. It has a distinct broad shoulder and full cheek. Its weight should be 160 grams and up. Its skin is thin and peel texture is smooth. More than 80% of the fruit is edible, making it thin-seeded. The flesh is meaty, smooth, firm, juicy, and non-fibrous. The size of the total blemishes found on the skin of the Guimaras mango shall not exceed 10% of the total fruit surface.

The tagline "the sweetest mango" is not without basis. A Total Soluble Solids (TSS) test on the Guimaras mango yields a sweetness ranging from 16°Brix and up. It has a "*marabo*" texture, a Guimarasnon word meaning a distinct blend of crunchiness, sweetness and sourness. (See Annex 8 for the determination of TSS.)

I.ii. Processed mango products

Processed mangoes may use the term “processed with Guimaras Mango” if 100% of the Mangoes comes from farms in Guimaras and are processed in Guimaras. The logo presented at the front cover page of this Code of Practice is reserved for the use on fresh mangoes.

II. The production process

II.i. Newly established plantation and orchards

II.i.i. Recommended requirements

II.i.i.i. Before planting

a) It is recommended to avoid planting in areas where there are plants that could serve as hosts to pests of Mango. However, should there be an existing standing crops, it is recommended that proper pest management should be applied to these neighboring crops.
b) Areas to be planted should be suitable to mango production, refer to Figure 2 at page 9, preferably calcareous “calcium rich” loamy soil with good internal drainage.
c) Any other mango variety other than the “Carabao”, as well as all shrubs and trees should be cleared from the field.
d) A soil analysis should be undertaken to determine the exact amount of fertilizer to be applied.

II.i.i.ii. When planting (newly established farm)

a) The recommended distance of planting is 20 x 20 meters.
b) Only certified mango seedlings coming from accredited nurseries by the Bureau of Plant and Industry or grafted trees from certified mango scions should be planted. The scion should be sourced from a registered mother mango trees. (See Annex 9 for the National Seed Industry Council approved strains.)
c) Recommended planting period is between June to November.

II.i.i.iii. Cultural Management on young trees (pre-bearing stage)

a) Young trees should be protected against weeds and other unwanted plant. Regular clearing of surroundings, weeding, and field sanitation is recommended.
b) Regular field clearing/sanitation is recommended. (See Annex 10 for general fertilizer recommendation.) Two applications, at the onset of the rainy season and before the end of rainy season.
c) Proper monitoring and management for insects, pest and diseases affecting the young trees.

Fertilization	1st Dose	2nd Dose
T14		
Muriate of Potash		
Ammonium Sulfate		
Ammonium Phosphate		
Organic Fertilizer		

II.ii. Farm Production Management (Fruit Bearing Trees)

II.ii.i. Pruning

- Pruning should be done regularly or as needed. Cut portion should be treated.

II.ii.ii. Clearing

- Regular field clearing/sanitation is recommended.

II.ii.iii. Fertilizer application

a) Conduct soil analysis at least every 2 years to determine the quantities of fertilizer to be applied but in the absence of soil analysis, general recommendation for fertilization of young trees is also recommended. (See Annex 10 for general fertilizer recommendation.)
b) Amount and type of fertilizer should be based on soil analysis.

Fertilization	1st Dose	2nd Dose
T14		
Muriate of Potash		
Ammonium Sulfate		
Ammonium Phosphate		
Organic Fertilizer		

II.ii.iv. Flower induction

a) Flower induction must be undertaken at least 8 months after flushing.
b) Recommended flower inducers are potassium nitrate (KNO_3) and calcium nitrate ($CaNO_3$) based. (Table type kind of inducers, plus rate of application (%)
c) Recommended application rates should be observed.

II.ii.v. Flower and Fruit Management

Insect-pest, Disease Management and Control

a) Fertilizer and pesticides registered for mango should be used.
b) Optional use of fertilizer and pesticides after bagging will be observed as needed.
c) Continuous fruit fly trapping is recommended to reduce fly population. Other host plants (star fruits, guava, santol, sineguelas, chico) must be properly managed.

d) Fruit bagging is recommended from 40 days after flower induction (DAFI).

e) Baggers must use appropriate safety gears when bagging fruits.

II.ii.vi. Harvesting

a) Mango fruits should be harvested at least 115 days after flower induction and should passed all the requirements needed.

b) Harvest time must be from 9 o'clock in the morning to 4 o'clock in the afternoon.

II.ii.vii. Post-harvest on farm:

a. Pre-sorting and classifying should be done immediately after harvest. Final sorting should be done in the packing house.

II.iii. Post-harvest handling at the post-harvest facility

II.iii.i. Hot water treatment

Mangoes must undergo hot water treatment (HWT) at 52-55 °C for 10 minutes, right after harvest but not more than 24 hours.

II.iii.ii. Classifying/Grading

Mango classification should be based on Philippine National Standards

II.iii.iii. Packaging

Mangoes should be packed in 3, 5, 20 kg paper boxes:

- In between mango layers, white paper should be used as lining.

II.iii.iv. Storage

Marketable mangoes should be disposed right after post-harvest treatment and packaging.

III. Control and Traceability

III.i. Internal

All mango growers and stakeholders should be registered to Guimaras Mango Growers and Producers Development Cooperative.

III.ii. Traceability:

1. Conduct of random sampling for chemical residue analysis.
2. Blockchain Technology and Provincial Office for Agricultural Services will maintain the records and control compliant to Code of Practice.

III.iii. Stickers

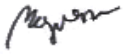
III.iv. Tasting

Conduct National Test Evaluation

IV. Labelling

The Guimaras Mango GI will have a distinct GI seal. Only producers who comply with the specifications contained in the Code of Practice shall be allowed to use the GI seal.

Board of Directors



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Chairperson, Board of Director

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Chairperson, Board of Director

ALFIE MALAN

Chairperson, Board of Director

JOEMARIE NOBLE

Chairperson, Board of Director

MARCIANO EFONDO

Chairperson, Board of Director

Annexes

Annex 1

Philippine National Standard for Fresh Fruit Mangoes

PHILIPPINE NATIONAL STANDARD

PNS/BAFPS 13:2004

ICS 65.020.20

BUREAU OF PRODUCT STANDARDS

Foreword

The formulation of this Philippine National Standard for Fresh Fruits – Mangoes, PNS/BAFPS 13:2004 was initially undertaken in July 2001 under the Bureau of Agriculture and Fisheries Product Standards (BAFPS)' Technical Assistance on Safety and Quality Standards Covering Products of High Value Commercial Crops, in view of the increasing demand of the commodity for the domestic and export markets.

This standard supersedes the PNS 168:1991 prepared by the Bureau of Product Standards' Technical Committee on Agricultural & Other Food Products and its Sub-Committee on Fresh Fruits, BPS/TC 20/SC 5. This revision was undertaken to update the standard in order to cope to the increasing needs of the industry. Modifications were made on the various clauses: definition of terms, grading, size classification, tolerances, packaging, contaminants and hygiene. The maximum levels for heavy metals and pesticide residues are included in this standard.

In 2003, the Bureau of Agriculture and Fisheries Product Standards (BAFPS) conducted series of technical reviews and public consultations nationwide on the draft standards for fresh mango fruits prior to its approval.

The Technical Committee and Sub-Committees of BAFPS organized through Special Order No. 411, series of 2001 set the classification of fresh mango fruit based on their physical characteristics and current practices existing in the sectors concerned.

In the preparation of this standard the following documents were considered:

Coates, L.T. Cooke, D. Persley, B. Beattie, N. Wade and R. Ridgway, 1995, Postharvest Diseases of Horticultural Product: Tropical Fruit (Vol. 2). Manager Publishing Services, Department of Primary Industries, Australia.

Mendoza, D.B. and R.H.H. Wills. 1984.Mango: Fruit Development, Postharvest Physiology and Marketing in ASEAN. ASEAN Food Handling Bureau, Kuala Lumpur, Malaysia.

Organic Fruit and Vegetables from the Tropics. United Nations. New York and Geneva,

Pp 109-118.

Pesticide residues in food. 1993. Joint FAO/WHO Food Standards Programme. Codex Alimentarius Supplement One to Volume Two. Codex Alimentarius Commission. United Nations. World Health Organization, Rome.

Philippine National Standards: Fresh Fruits and Vegetables – Mangoes (Mangifera indica Linn.) Grading and Classification. PNS 168:1991; Bureau of Product Standards, Department of Trade and Industry, Makati, Philippines.

1 Scope

This standard establishes a system of grading and classifying commercial mango fruits grown from *Mangifera indica Linn* of the Mangiferae family produced in the Philippines to be supplied fresh to the consumer.

2 References

PNS ISO 874:2004 – Fresh fruits and vegetables – Sampling contains provisions which, through reference in this text form part of this national standard. At the time of publication, the edition indicated was valid.

3 Definitions

For the purpose of this standard, the following definitions shall apply:

3.1 General definitions

3.1.1

clean

the fruit is free from any foreign matter

3.1.2

damage

any defect or injury, which affects the appearance, shipping and eating qualities of the fruit

3.1.3

diameter

the distance across the smallest round opening through which the mango will pass without pressure

3.1.4

fairly well formed

the fruit may slightly deviate from its characteristic shape, but not to an extent whereby its appearance is materially affected

3.1.5

mango

a tropical tree scientifically known as *Mangifera indica Linn* . Its fruit is a fleshy drupe, resinous, variable in shapes and dimensions, consisting of leathery peel, fleshy pulp and fibrous stone. There are many known varieties of mangoes in the Philippines of which 'Carabao' mango and 'Pico' mango are most noted

3.1.6

mature

the mango has reached the stage of development which ensures the proper completion of the ripening process (Annex A)

3.1.7

overripe

the fruit is very soft and has passed its commercial utility

3.1.8

smooth

the contour of the fruit is regular and free from ridges and grooves, or other irregularities of the peel of the fruit

3.1.9

well-formed

the fruit has the typical shape of the variety, symmetrical and without irregularities in shape

3.1.10

well-trimmed

the stem is neatly cut off at a point not more than 2.5 mm beyond the fruit

4 Kinds of Damage

4.1 Pre-harvest defects (see Annex D)

4.1.1 "Balat-kawayan" (evergreen) – Unusually deep green color of the peel which does not disappear with normal ripening.

4.1.2 Discoloration – Distinct deviation from the typical color of the fruit.

4.1.3 Heat injury – A portion of the peel which exhibits dull yellow to yellow in color.

4.1.4 "Intul-tol" – A disorder characterized by dark brown to black depression on the peel of the fruit, not localized and already apparent even while the fruit is on the tree.

4.1.5 Misshapen – the mango is irregular or abnormal in shape.

4.1.6 Mottling – Colored spots, blotches or clouding on the peel of the fruit.

4.1.7 "Ugat" – Netted appearance of the peel due to prominent veins which appears during rainy season.

4.1.8 Wind scar – Brownish streak, slightly elevated due to mechanical abrasion.

4.2 Pathological damage

4.2.1 Anthracnose – Small, circular, light brown lesions on the skin, which becomes apparent as the fruit ripens.

4.2.2 Scab – Patches with fissured corky tissue on the fruit.

4.2.3 Sooty mold – black powdery substance appearing as irregular spots on the surface usually on the pedicel end.

4.2.4 Stem-end rot – Black lesion on the skin at the stem end of the fruit. The lesion is soft, watery and affects the flesh.

4.3 Insect and animal damage (see Annex F)

4.3.1 Fruit fly – The external signs of fly infestation are soft brownish spots beneath the peel where the larvae cause extensive tissue damage. Further breakdown is accelerated by secondary microbial activity.

4.3.2 Helopeltis damage – Feeding points of the insect produce corky spots sometimes randomly scattered over the fruit surface; only the skin is affected; feeding injury is often called "kurikong" or "armalite".

4.3.3 Insect and animal injury – Punctures, feeding and scratch scars, oviposition, entry/exit holes of insects visible to the naked eye.

4.3.4 Mealy bug damage – Stains the fruit white due to white flour-like substance, which covers its body surface. The damaged parts are also usually covered with black sooty mold growing on the honeydew produced by the mealy bug.

4.3.5 Scale insect damage – Feeding punctures left by the scale insect result in whitish to yellowish spots on the peel

4.4 Handling damage (see Annex G)

4.4.1 Abrasion – An abraded spot or area on the peel as a result of scraping or rubbing off.

4.4.2 Compression – Flattened and/or dented areas on the fruit which have been caused by pressure on the packaging material; the damaged portion of the peel fails to develop the normal color during ripening.

4.4.3 Crack – A split on the fruit which makes the pulp slightly visible.

4.4.4 Cut – Damage in the form of cleft or wound on the fruit caused by a sharp object.

4.4.5 Latex burn – Latex stains characterized by brownish streaks on the peel which may be sunken.

4.4.6 Latex stains – Ooze sap around the stem or on the cheeks of the fruit remaining as a clear, sticky fluid on the skin detracting from the fruit's appearance.

4.4.7 Lenticel spotting – Tiny black spots (needle-sized) scattered on the fruit surface which are apparent in the green and ripe stage: occurrence is attributed to prolonged wet periods or soaking in water especially with detergent, leading to lenticel "blow out".

5 Varieties

5.1 'Carabao' – Fruit is oblong which blunt apex, full cheeks and a rather indistinct beak. When ripe, the flesh is golden yellow, very tender with delicate, aromatic non- turpentine flavor, exquisite sub-acid taste. The fiber is medium coarse but confined almost entirely to the edges of the stone. The peel is smooth and bright yellow when ripe and has delicate aroma. 'Carabao' mango is known in the international trade as "Philippine Super Mango"

5.2 'Pico' – Fruit is medium-sized, more slender than the 'Carabao' mango, asymmetric with rounded apex and distinct beak. Peel is smooth, orange yellow, thick and tough when ripe. Flesh is yellow-orange, tender, richer and sweeter than 'Carabao' mango but lacks the delicate aroma of 'Carabao' mango. The fibers are fine, short and confined almost entirely to the edges of the stone.

6 Minimum requirements

In all classes, subject to the special provisions for each class and tolerances allowed, mango fruits shall meet the following requirements:

6.1 Mango must be mature and its shape characteristic of the variety.

6.2 Mango must be reasonably clean and free from any visible foreign matter.

6.3 Mango must be free from diseases and insects.

6.4 Mango must be free from any injury.

7 Classification

Mango fruit shall be classified according to its general appearance, quality and condition.

7.1 Extra class – Mangoes in this class shall be of superior quality and have the characteristic of the variety. They shall be mature, clean, well-trimmed, well-formed, smooth and free from pre-harvest defects and defects associated with insects, diseases and handling with the exception of very slight superficial defects, provided that these defects do not affect the general appearance of the produce, the keeping quality and presentation in the package.

7.2 Class I – Mangoes in this class shall be of good quality and have the characteristic of the variety. They shall be mature, clean, well-trimmed, well-formed, smooth and free from pre-harvest defects and defects associated with insects, diseases and handling with the exception of very slight superficial defects, provided that these defects do not affect the general appearance of the produce, the keeping quality and presentation in the package.

7.3 Class II – Mangoes in this class which do not qualify for inclusion in the higher

classes but satisfy the requirement of class II. Mangoes shall be mature, fairly clean, well- trimmed, fairly well-formed, smooth and free from diseases, insect, infestation and any damage that materially affects the general appearance of the produce, the keeping quality and presentation in the package.

8 Size classification

Mango fruits may be classified according to weight as shown in Annex B.

9 Tolerances

9.1 Extra class – Five percent by number or weight of the fruit in any lot shall fail to meet the requirements of the class and shall conform to the requirements of class I.

9.2 Class I – Ten percent by count or weight is allowed for off-sized including not more than 1% by count for other defects shall fail to meet the but shall conform to the requirements of the next lower grade.

9.3 Class II – Ten percent by count or weight is allowed for off-sized including not more than 2% by count for other defects shall fail to meet the requirements.

10 Sampling

Sampling method to be used for ascertaining conformance to the requirements of this specification shall be in accordance with PNS ISO 874.

11 Provisions regarding presentation

11.1 Uniformity

Each package shall be uniform and contain only mangoes of the same origin, variety, quality and size. The visible part of the package shall be the representative of the entire contents.

11.2 Packaging

Mangoes shall be packed in suitable containers that will avoid causing any external or internal damage to the produce. The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of mangoes.

12 Marking or labelling

Each container shall have a label or legible characters grouped on the same side, stamped in indelible ink to provide the following:

12.1 Name of produce, variety or commercial type;

12.2 Class and size or number of pieces;

12.3 Net weight (in kilograms);

12.4 Name of producer and exporter; and

12.5 The words “Product of the Philippines”.

13 Contaminants

13.1 Heavy Metals

Mangoes shall comply with those maximum residue levels for heavy metals established by the Codex Alimentarius Commission for this commodity (Annex H).

13.2 Pesticide Residues

Mangoes shall comply with those maximum residue levels established by the Codex Alimentarius Commission for this commodity (Annex I).

14 Hygiene

14.1 It is recommended that the produce covered by the provisions of this standard be prepared and handled in accordance with appropriate sections of the Recommended International Code of Practice – General Provisions of Food Hygiene (CAC/RCP 1 – Rev. 2-1985) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

14.2 The produce shall comply with microbial criteria established in accordance with the Principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21 – 1997).

15 Compliance and specification

When found to comply with the requirements specified in this Philippine Standard Specification, the lot, the batch, or the consignment from which the samples have been drawn, shall be deemed to comply with this Philippine National Standard Specification.

Annex A

Stages of ripeness of 'carabao' and 'pico' mango fruits

Stage of ripeness	Peel color	Flesh color
Green	Completely light green	Yellowish white or light yellow green
Breaker	Traces of yellow	Middle area and fruit outline yellowish; other areas, white to yellowish white
Turning	More green than yellow	More yellow than white
Semi-ripe	More yellow than green	Yellow for 'carabao'; yellow orange for 'pico'
Ripe	80-100% yellow ('carabao') or yellow orange ('pico')	Middle area yellow for 'carabao'; yellow orange for 'pico'
Overripe	Yellow for 'carabao'; yellow orange for'pico'	100% yellow for 'carabao' and yellow orange for 'pico'

Annex B

Size classification of green 'carabao' mango fruits

Size	Weight (g)	Number of pieces/carton			
		2.5 kg	5.0 kg	10 kg	12.0 kg
Extra large	> 350	6 - 7	12 - 14	24 - 28	30 -32
Large	300 - 349	8	16	32	41- 43
Medium	250 - 299	10	20	40	41 – 50
Small	200 - 249	12	24	48	51 – 63
Super small	160 - 199	14 - 16	28 - 32	56 - 64	64 – 75

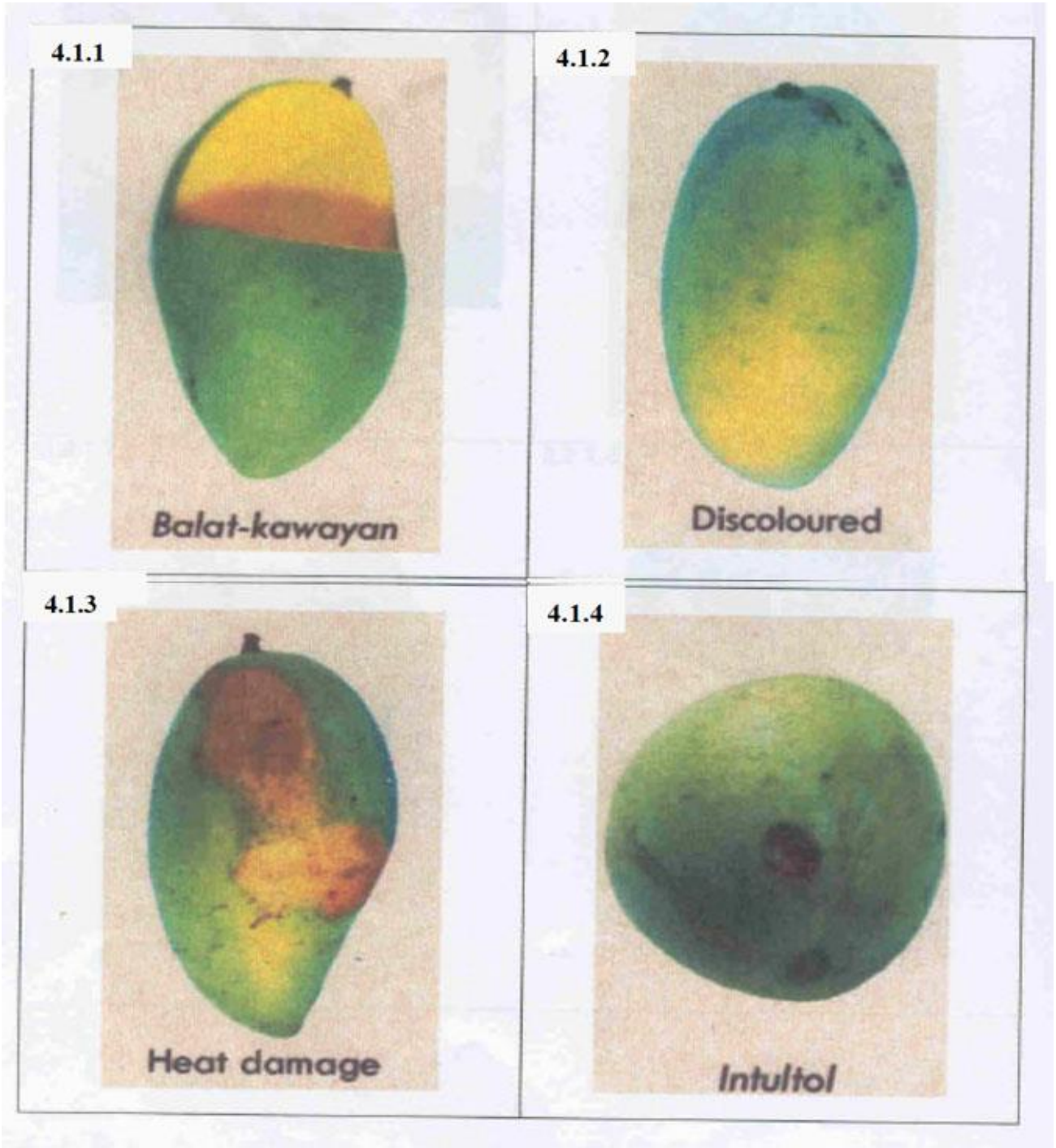
Annex C

Size classifications of 'pico' mango fruits

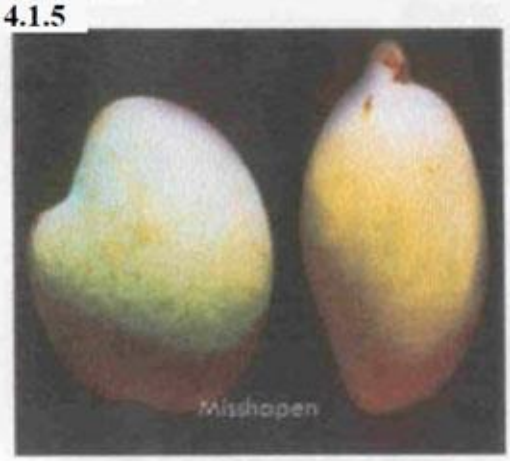
Size	Weight (g)
Extra large	> 300
Large	251 – 300
Medium	201 – 250
Small	151 – 200
Super small	> 100

Annex D

Pre-harvest defects



4.1.5



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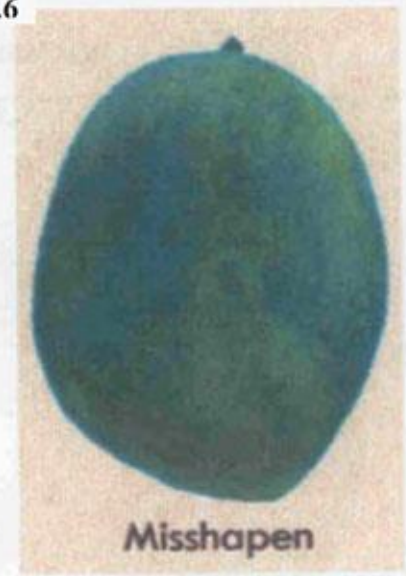


4.1.7

4.1.8

Annex E

Pathological damage

4.2.1

Anthracnose

4.2.2

Scab

4.2.3

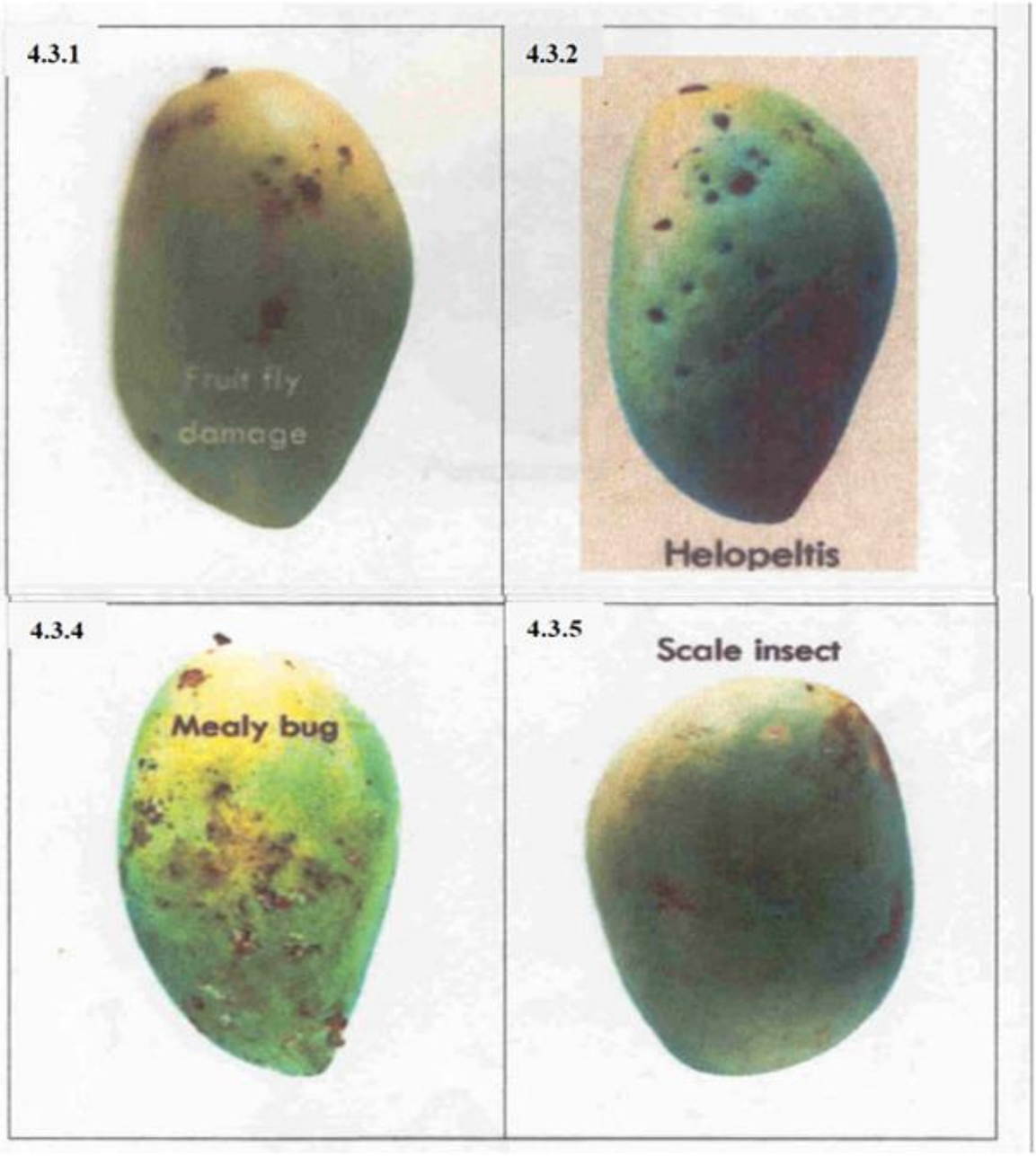
Sooty mold

4.2.4

Stem-end rot

Annex F

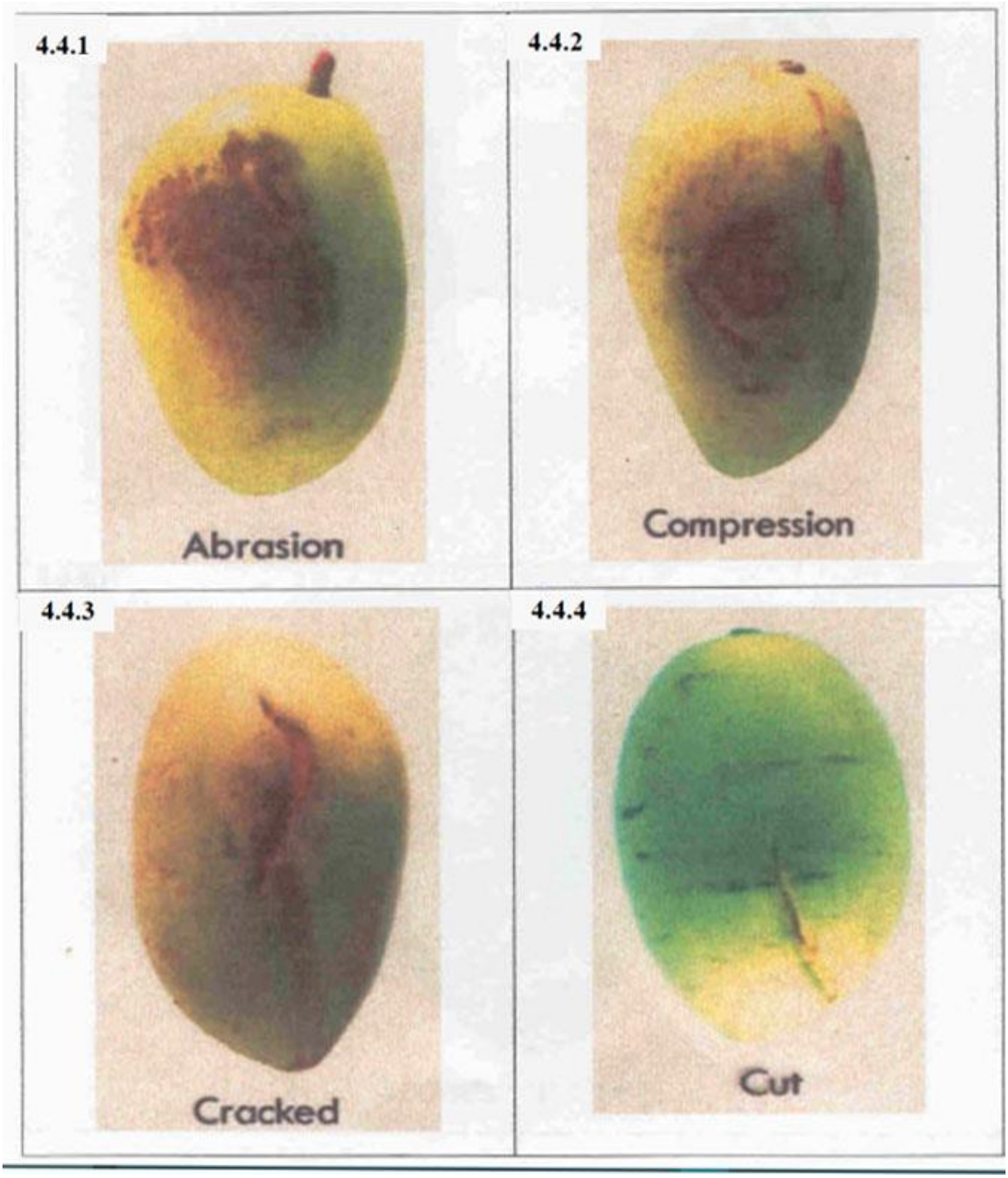
Insect and animal damage




Punctured

Annex G

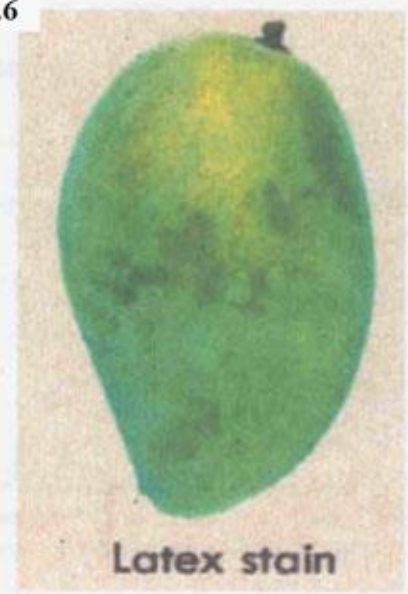
Handling damage



4.4.5

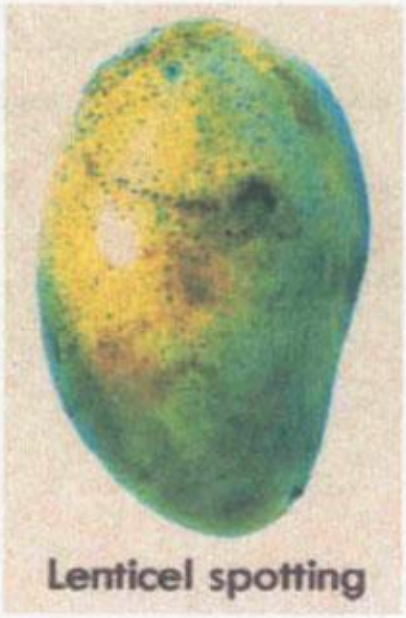
Latex burn

4.4.6



Latex stain

4.4.7



Lenticel spotting

Annex H

Heavy metals content of mango fruits

Heavy Metals	Maximum Value (mg/kg)
Lead (Pb)	0.50
Cadmium (Cd)	0.05
Mercury (Hg)	0.03
Source: Organic Fruit and Vegetables from the Tropics. United Nations. New York and Geneva, 2003. Pp. 109-118	

Annex I

Pesticide residues in mango fruits

Pesticides	MRL (mg/kg)
Carbendazin	2.0
Prochloraz	2.0 Po
Propiconazole	0.05
Triadimefon	0.1 (*)
* At or about the limit of determination. Po The MRL accommodates post-harvest treatment of the commodity.	
Source: Pesticide residues in food. 1993. Joint FAO/WHO Food Standards Programme. Codex Alimentarius Supplement One to Volume Two. Codex Alimentarius Commission. United Nations. World Health Organization.	

Department of Agriculture

Bureau of Agriculture and Fisheries Product Standards

Technical Sub-Committee on Crops

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Postharvest Horticulture Training and
Research Center, UP Los Baños

Members

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Technical Assistance on Codex Standards
and Food Hygiene

4 Ms. Mary Grace S. Rivere
Technical Assistance on Codex Standards
and Food Hygiene

Annex 2

Provincial Ordinance No. 003, Series of 2011

Republic of the Philippines
Province of Guimaras
OFFICE OF THE SANGGUNIANG PANLALAWIGAN

EXCERPTS FROM THE MINUTES OF THE REGULAR SESSION OF THE HONORABLE SANGGUNIANG PANLALAWIGAN OF THE PROVINCE OF GUIMARAS HELD AT THE SP SESSION HALL, PROVINCIAL CAPITOL ON SEPTEMBER 07, 2011.

PRESENT:

Hon. Aurelio G. Tionado	-	*Vice Governor/Presiding Officer*
Hon. Avelino G. Gonzaga	-	*Board Member/Floor Leader*
Hon. Vicente B. de Asis	-	*Board Member*
Hon. Roy P. Habaña	-	*Board Member*
Hon. Rolando T. Gadnanan	-	*Board Member*
Hon. Wilme G. Denila	-	*Board Member*
Hon. Patricio G. Gange	-	*Board Member*
Hon. Josephine M. Detablan	-	*Board Member*
Hon. Emilio S. Esmeralda	-	*Board Member*
Hon. Nelly M. Sideño	-	*Ex-Officio Member (PCL Fed. President)*
Hon. German G. Gacho	-	*Ex-Officio Member (ABC Fed. President)*
Hon. Renj Leonifel Trompeta	-	*Ex-Officio Member (SK Fed. President)*

OFFICIAL BUSINESS:

None

ABSENT:

None

ORDINANCE NO. 2011-003
Series of 2011

AN ORDINANCE AMENDING ORDINANCE NO. 03, SERIES OF 2010, REGULATING THE HARVESTING AND SALE OF IMMATURE MANGO FRUITS INTENDED FOR TABLE RIPE CONSUMPTION IN THE PROVINCE OF GUIMARAS

Be it ordained by the Sangguniang Panlalawigan of the Province of Guimaras in session duly assembled that:

Section 1. ***Title***- *This Ordinance shall be known as "Amended Ordinance Regulating the harvesting and sale of immature mango fruits intended for table ripe consumption in the Province of Guimaras."*

Section 2. *The enactment of this Ordinance is in accordance with the Local Government Code of 1991, Section 16 in the exercise of the general welfare clause and in support to the advocacy campaign of the province for the production of quality and sweet mangoes that are harvested at the right stage of maturity that promote agriculture and tourism industry of the province.*

Section 3. ***Declaration of Policy:*** *It is hereby declared as the policy of the Province of Guimaras to maintain its status as producer of the sweetest and the best quality mangoes and encourage mango growers, contractors, producers, traders, retailers, sellers to harvest and sell mangoes based on the required stage of maturity.*

Section 4. ***Scope and Coverage***- *This Ordinance shall apply to all stakeholders in the Province of Guimaras involved in mango production, harvesting and marketing.*

Section 5. ***Definition of Terms:*** *When used in this Ordinance, the following terms and phrases shall mean:*

Buyer/Consumer	-	*Those that buy for consumption of Guimaras mangoes.*
Contractor/s	-	*is a person or a group of persons that provides capital and hold responsibility of managing the mango production and marketing who usually gets a share of the mango fruits produce depending on their agreement with the mango owner.*
Flotation method	-	*is a method of separating mature fruits from Immature by dipping at 1% salt solution. When considered mature, at least 75% of sample fruit will sink in the bottom of the container.*
Guimaras "Carabao" Mango	-	*is a popular and export winner fruit of the Province of Guimaras. It is best serve as fresh fruit. It has a perfect blend of sweetness and sourness, succulent, and has a pleasant aroma. Fleshly and yellow when ripe, very tender, melting in the mouth and less fibrous.*
Immature Mango	-	*fruit which does not meet the characteristics of a mature fruit such as: shoulder of fruit not broaden, will float when dip in water with 1% salt solution, sour when ripe and TSS reading below 16 degree brix and skin shrink when ripe and usually fruit is harvested below 110 days after flower induction (DAFI).*
Induction of Mango Tree	-	*is a method of producing or enhance flowering by way of spraying water solution containing Potassium Nitrate (KNO3), Calcium Nitrate (KNO3), Calcium Nitrate (CaNO3) and their formulated products commercially available in the market.*
Mango Growers	-	*owner of the mango tree/s and the land where the Trees are situated.*
Mango Producers	-	*one who is involved in the production aspect of Mango, could be an owner, grower or contractor.*
Mango Stakeholders	-	*all mango industry players such as mango growers, contractors, producers, traders, retailers, sellers, and consumers.*

Market	-	*a place which allows the trading, selling and purchasing of mango fruits. The place can be a market place or a street market/stall or in a trade fair and exhibits.*
Mature Mangoes	-	*fruits that meet the characteristics of carabao mango variety (as specified in this section).*
Natural Flowering	-	*the normal and self-initiated flowering of the mango tree without application of flower inducing chemicals.*
Retailers	-	*are those that buy mangoes from traders and sell it again to consumers for profit purposes.*
Table Ripe Consumption	-	*mango fruits that meet the characteristics of a mature fruit usually at 8 to 10 days after harvest (DAH) meets the characteristics of Guimaras carabao mango.*
Traders	-	*those that involved in buying mango fruits at a farm gate price and sell it to the marketplace for profit purposes.*
TSS Reading	-	*the quickest and accurate way of determining total soluble solid or sugar content of the fruit with the use of Refractometer in a degree brix reading.*

Section 6. ***Institutional Mechanism***

a. *The harvesting and sale of immature mango fruits intended for table ripe consumption is regulated in the Province of Guimaras.*

b. *A barangay certification shall be secured from the Barangay where the mango trees are planted prior to the harvest of mango intended for table ripe consumption. For a barangay to issue a certificate, the mango producer shall register with the Office of the Punong Barangay after fifteen (15) days but not more than twenty (20) days from the date of induction, the number of mango trees that flowered and sitio/location in the barangay. The mango producer shall again report to the barangay the number of mango fruits bagged not later than seventy days after induction. Trees that flowered naturally shall also be registered for purposes of this ordinance. Monthly data on Number of trees induced, number of mango fruits bagged and barangay certificate issued shall be submitted by the Barangay not later than 5 days after the end of each month to the Office of the Municipal Agriculturist who shall consolidate the report for submission to the Office of the Provincial Agriculturist.*

c. *The barangay shall issue the Mango Certification as to the number of days from date of induction to harvest of mangoes including the estimated volume of harvest and may collect the corresponding Certification Fee pursuant to their Tax Ordinance.*

d. *Mango traders and retailers shall demand a copy of Barangay Mango Certification from producers to ensure the quality of mango fruit for table ripe consumption in the market and shall be ready to present such certification to the consumers or the Task Force Golden Fruit.*

Section 7. ***Creation of Task Force*** *- Task Force Golden Fruit is hereby created under the Office of the Governor to ensure that only quality and mature mangoes intended for table ripe consumption are traded and sold at the markets in the Province of Guimaras. The Task Force is hereby authorized to check and administer a random testing such as floatation method, brix reading using a mangoes are sold at the market. Mango traders, sellers and retailers shall provide free sample to the Task Force for testing purposes.*

Section 8. ***Composition of Task Force*** *– The Task Force Golden Fruit shall be composed of the following:*

Chairperson	:	*Provincial Agriculturist*
Members	:	*Municipal Agriculturist or Authorized Representative*
		Chairperson, Guimaras Mango Growers and Producers Development Cooperative or any Authorized Representative
		Chairperson, Municipal Mango Growers Association Or Authorized Representative
		Guimaras PMSMEOC Representative
		DTI- Guimaras Representative
		NMRDC Representative
		PNP Representative
		Law Enforcement and Public Safety TF Representative

Section 9. ***Task Force Functions***

1. *Conduct field monitoring, inspection and fruit evaluation by determining the TSS of fruits sold at different fruit stands and issue certification that it has passed the quality standard.*

2. *Provide technical assistance, advocacy campaign to all mango stakeholders.*

3. *Set up production database based on reports from barangay permits issued.*

4. *Determine proper disposal of confiscated mango fruits.*

5. *Submit status report to the Office of the Governor.*

Section 10. ***Penal Clause*** *– Any person who violates any provision of this Ordinance shall be fined in the amount of Five Thousand Pesos (P5,000.00) or six (6) months imprisonment or both at the discretion of the court of jurisdiction. Mangoes being sold in the market of this province that did not pass the testing conducted by the Task Force shall be confiscated and disposed to Charitable Institutions or other institutions to be determined by the Task Force.*

Section 11. ***Effectivity Clause*** *– This Ordinance shall be effective fifteen (15) days after its publication or posting in conspicuous places in five (5) municipalities in the Province of Guimaras.*

ENACTED, this 07th day of September 2011.

I hereby certify to the correctness of the foregoing ordinance which was duly enacted by the Sangguniang Panlalawigan of the Province of Guimaras during its regular session on September 07, 2011.

LORENA MINERVA-ITUCAS
Secretary to the Sanggunian

We Concur:

VICENTE B. DE ASIS
Board Member

ROY P. TABANA
Board Member

ROLANDO T. GADNANAN
Board Member

WLIME G. DENILA
Board Member

PATRICIO G. GANGE
Board Member

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Ex-Officio Member
(PCL Fed. President)

GERMAN G. GACHO
Ex-Officio Member
(ABC Fed. President)

RENJ LEONIFEL C. TROMPETA
Ex-Officio Member
(SK Fed. President)

Attested:

AURELIO G. TIONADO
Vice Governor
Presiding Officer

Approved:

FELIPE HILAN A. NAVA, M.D.
Governor

Annex 3

MIN infonews

MIN news
MANGO INFORMATION NETWORK
A Quarterly Publication of the Mango Information Network (MIN)
Vol.4 No.2
April-June 2001

'Manila Super Mangoes' from Guimaras exported to Australia, soon the US

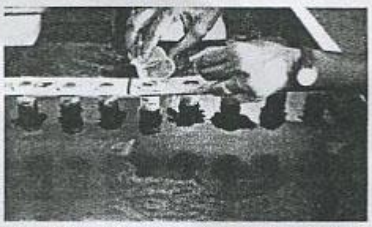
Yes, you read it right! On May 30, 2001, the first shipment of mangoes from Guimaras entered Sydney, Australia, thanks to the research works of Dr. Hernani G. Golez, Agricultural Center Chief III of the Bureau of Plant Industry-National Mango Research and Development Center (BPI-NMRDC), who cleared the island province from the issue of quarantine pests, mango seed and pulp weevils.

Quality mangoes from the field were harvested, washed, sorted and packed in the Center under the supervision of Dr. Golez and quarantine officers from Region 6. Each box containing 20 to 25 fruits were sent to Manila by air cargo and underwent a postharvest treatment against fruit flies using vapor heat treatment (VHT) at Food Terminal Incorporated (FTI). Treated fruits were further repacked using appropriate boxes and sent to Australia by plane.

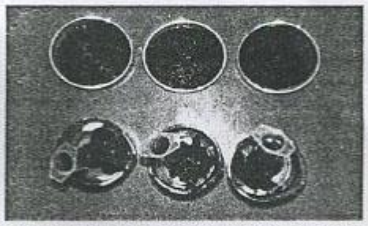
In this initial shipment, about two tons of mango fruits were exported to determine the expenses incurred in transport, handling security and quality evaluation.

Growers in the island are very optimistic that mangoes from Guimaras will be highly accepted and more fruits will be exported in the coming months. Guimaras mango will supply the market demands of Australia during the off-season production of Kensington Pride on the months of May, June, July and August.

Last June 14, export of 'Carabao' mangoes from Guimaras to the United States was approved, according to Agriculture Secretary Leonardo Montemayor. Hopefully the actual export will begin in July.



In Dr. Golez' study which led to the export of 'Manila Super mangoes' from Guimaras, immature stages of fruitfly species were subjected to different immersion times and water temperatures.



Samples were placed in cold water and laid in petri dishes.

Dr. Golez however, reported that volume of mango fruits from the island is not enough to supply the export demands of the two countries. With 130,000 existing trees,

page 4

Technology Feature

Paclobutrazol: New Age Flower Inducer in Mango Trees

Since the 1970s, potassium nitrate (KNO_3) has been the technology used for flower induction in mango trees. However, an alternative theory was presented stating that KNO_3 was not involved in flowering, but in bud dormancy breaking. A biochemical or morphological marker was needed to identify if a tree was ready to flower, so that KNO_3 could be sprayed for bud breaking.

This scenario prompted Dr. Calixto Protacio, Julita Quinto, and Gina Molinyawe of the Department of Horticulture; Restituto Bugante Jr. (retired University Researcher), and Gerry Paelmo of the Postharvest Horticulture Training and Research Center or PHTRC (both under the College of Agriculture, University of the Philippines Los Baños) to address the problem on the regulation of flowering in 'Carabao' mango trees.

The team studied if paclobutrazol, a synthetic plant regulator (PGR), could induce better flowering response of 'Carabao' mango to KNO_3. The study was expected to clarify the roles of KNO_3 and paclobutrazol in mango flowering, as well as determine the dosage recommendation for paclobutrazol use and the general guide for its application.

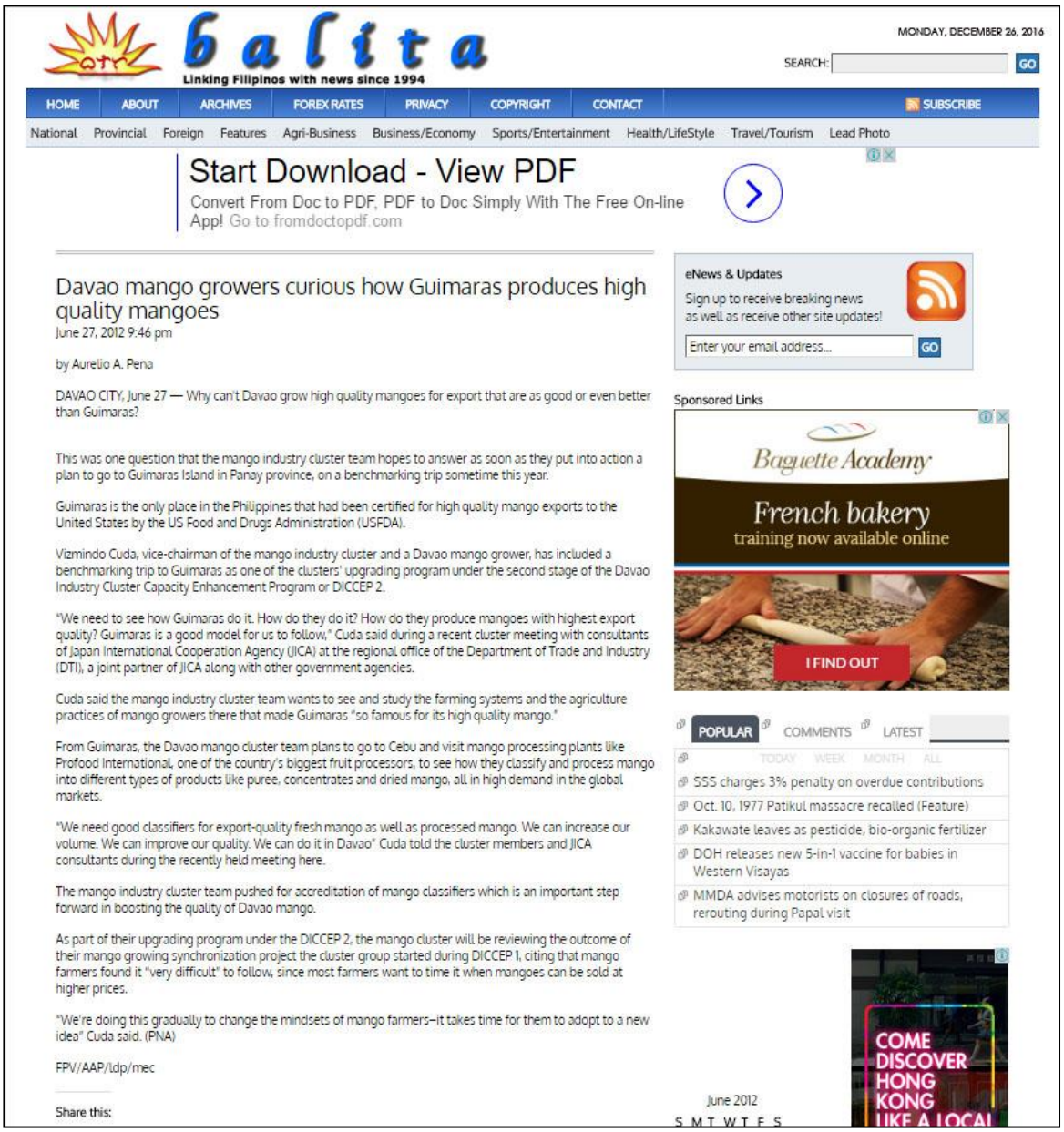
Paclobutrazol by synthesis is an inhibitor of giberellic acid (GA), which happens to be a flowering inhibitor. In Africa, GA is used to delay and schedule flowering.

page 3

Annex 4

Balita article about Guimaras Mango

Pena, Aurelio A. (2012, June 27). *Davao mango growers curious how Guimaras produces high quality mangoes*. Retrieved from **http://balita.ph/2012/06/27/davao-mango-growers-curious-how-guimaras-produces-high-quality-mangoes/**



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Davao mango growers curious how Guimaras produces high quality mangoes

June 27, 2012 9:46 pm

by Aurelio A. Pena

DAVAO CITY, June 27 — Why can't Davao grow high quality mangoes for export that are as good or even better than Guimaras?

This was one question that the mango industry cluster team hopes to answer as soon as they put into action a plan to go to Guimaras Island in Panay province, on a benchmarking trip sometime this year.

Guimaras is the only place in the Philippines that had been certified for high quality mango exports to the United States by the US Food and Drugs Administration (USFDA).

Vizmindo Cuda, vice-chairman of the mango industry cluster and a Davao mango grower, has included a benchmarking trip to Guimaras as one of the clusters' upgrading program under the second stage of the Davao Industry Cluster Capacity Enhancement Program or DICCEP 2.

"We need to see how Guimaras do it. How do they do it? How do they produce mangoes with highest export quality? Guimaras is a good model for us to follow," Cuda said during a recent cluster meeting with consultants of Japan International Cooperation Agency (JICA) at the regional office of the Department of Trade and Industry (DTI), a joint partner of JICA along with other government agencies.

Cuda said the mango industry cluster team wants to see and study the farming systems and the agriculture practices of mango growers there that made Guimaras "so famous for its high quality mango."

From Guimaras, the Davao mango cluster team plans to go to Cebu and visit mango processing plants like Profood International, one of the country's biggest fruit processors, to see how they classify and process mango into different types of products like puree, concentrates and dried mango, all in high demand in the global markets.

"We need good classifiers for export-quality fresh mango as well as processed mango. We can increase our volume. We can improve our quality. We can do it in Davao" Cuda told the cluster members and JICA consultants during the recently held meeting here.

The mango industry cluster team pushed for accreditation of mango classifiers which is an important step forward in boosting the quality of Davao mango.

As part of their upgrading program under the DICCEP 2, the mango cluster will be reviewing the outcome of their mango growing synchronization project the cluster group started during DICCEP 1, citing that mango farmers found it "very difficult" to follow, since most farmers want to time it when mangoes can be sold at higher prices.

"We're doing this gradually to change the mindsets of mango farmers–it takes time for them to adopt to a new idea" Cuda said. (PNA)

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June 2012
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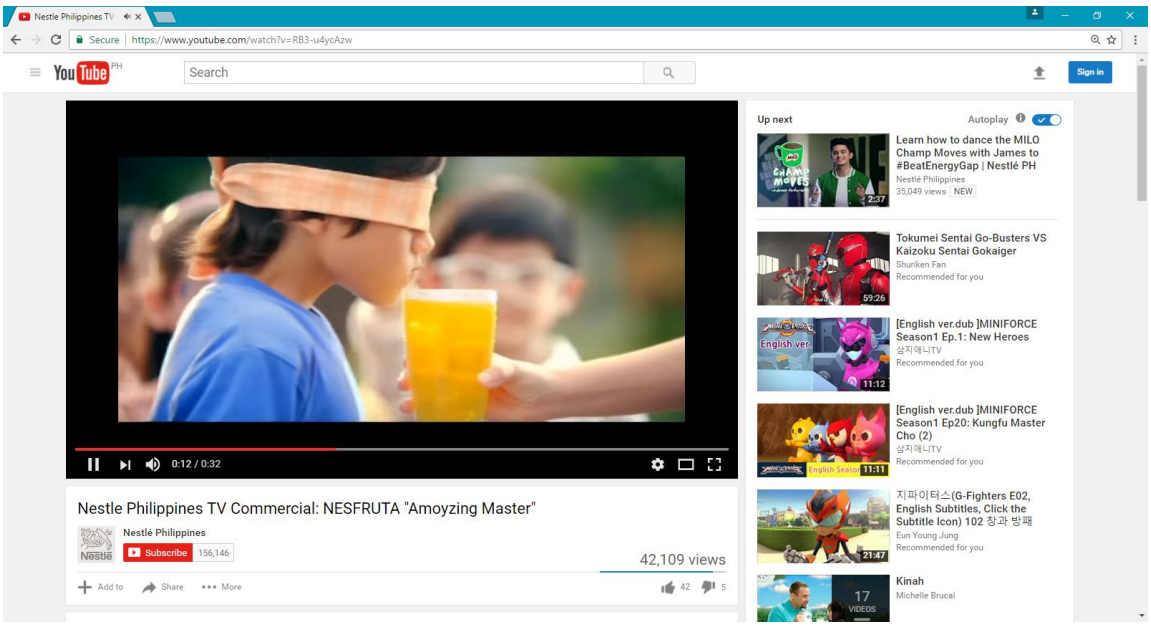
Annex 5

NESFRUTA "Amoyzing Master" Advertisement



Nestlé Philippines, Inc. (2013, June 21). *Nestle Philippines TV Commercial: NESFRUTA "Amoyzing Master"* [Video file]. Retrieved from **https://www.youtube.com/watch?v=RB3-u4ycAzw**

Annex 6

Guimaras Super Galila

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Guimaras Super Galila, the sweetest Carabao mango

(The Philippine Star) | Updated January 3, 2018 - 12:00am

MANILA, Philippines – People have come to associate Guimaras with mangoes, the island's most important agricultural crop and the country's export champion.

Guimaras mangoes are internationally-certified as free from mango seed and pulp weevils, making their way into the US and Australian markets through "Area Freedom Certification".

The Guimaras National Crop Research Development and Production Support Center (GNCRDPSC) is spearheading the development of effective and appropriate pre-production, production, and post-production mango technologies and its wide adoption. One of the center's most important research functions is on varietal improvement.

To date, 15 National Seed Industry Council (NSIC) – registered mango fruit varieties have been developed.

The NSIC is the office responsible for the approval and registration of crop varieties in the country. Among these include: GES 73', GES 77', GES 84', GES 85', MMSU Gold, Fresco, Talaban, Sweet Elena, Tanalcon, Guimaras Super (Galila), Efondo, Corcino, Prima, JTA Sweet, and P1-King Rodolfo.

The codex standard for mangoes states that quality mangoes must be clean, free of damage caused by pests, free of any foreign smell and/or taste, firm, fresh in appearance, free of black necrotic stains or traits, free of marked bruising, and sufficiently developed and display satisfactory ripeness.

Although consumers buy fruits on the basis of appearance, subsequent purchases depend upon the consumers' satisfaction with the flavor (sweetness and acidity).

Guimaras mangoes are of excellent quality and considered as one of the sweetest in the world.

Among the 15 registered strains of Carabao mango, 10 were developed by the Center with Guimaras Super (Galila) having the sweetest taste.

"While many articles have contended that Zambales' Sweet Elena is the sweetest Carabao mango strain, in terms of degree Brix ("Bx), the Super Galila tops them all," said Helen Bignayan, a senior agriculturist at GNCRDPSC.

Brix is the sugar content of an aqueous solution. One degree Brix is one gram of sucrose in 100 g of solution and represents the strength of the solution as percentage by mass.

The °Bx is traditionally used in the wine, sugar, carbonated beverage, fruit juice, and honey industries to measure the sugar content.

Acording to Bignayan, Guimaras Super (Galila) has 22.3 °Bx while Zambales' Sweet Elena only has 18.98 °Bx.

When it comes to fruit weight, a Sweet Elena fruit can weigh as much as 357 g while a Galila fruit weighs heavier with 367 g.

In terms of peel and flesh color, Sweet Elena has orange peel and yellow orange flesh while Galila is bright yellow in the outside and orange in the inside.

The Galila mango has a slightly thicker peel (0.93 mm) compared to Sweet Elena (0.80 mm). The flesh texture of Sweet Elena is soft while that of the Galila is smooth and firm.

The Guimaras Super (Galila) is owned by Cesar Galila in Barangay Poblacion, Nueva Valencia, Guimaras. Mango strains are often named after the surnames of the owners of the mother tree.

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The Philippine Star Global: Business, (2016). Guimaras Super Galila, the Sweetest Carabao Mango. Retrieved from:

http://www.philstar.com/agriculture/2016/01/03/1538636/guimaras-super-galila-sweetest-carabao-mango

Annex 7

Mango Tree Population

Mango Tree Population in Guimaras for CY 2014, by Municipality

Municipality	Bearing		Non-Bearing		Grafted		Seeded		Total
	No.	%	No.	%	No.	%	No.	%	
Buenavista	114,015	59	24,258	30	96,791	51.1	41,482	48.6	138,273
Jordan	35,530	18.3	10,611	13	32,299	17.0	13,842	16.2	46,141
Nueva Valencia	16,720	8.6	12,242	15	17,377	9.2	11,585	13.6	28,962
San Lorenzo	12,540	6.5	13,057	16	17,918	9.5	7,679	9.0	25,597
Sibunag	14,630	7.6	21,219	26	25,094	13.2	10,755	12.6	35,849
TOTAL	193,435	100	81,387	100	189,479	100	85,343	100	274,822

Distribution of mango farmers

MUNICIPALITY	NUMBER	PERCENT
Buenavista	2,121	27
Jordan	1,413	18
Nueva Valencia	1,963	25
San Lorenzo	864	11
Sibunag	1,570	19
GUIMARAS	7,931	100

MUNICIPALITY	NUMBER

Buenavista	996
Jordan	631
Nueva Valencia	635
San Lorenzo	748
Sibunag	485
GUIMARAS	3,495

STATUS OF MANGO PRODUCTION	
Total area planted	6,037.6 hectares
Total number of trees	274,822
Total Number of non-bearing trees	81,387
Total Number of bearing trees	193,435
Total Number of Mango Growers	7,931

GUIMARAS MANGO PRODUCTION	
YEAR	PRODUCTION (MT)
2002	11,320
2003	11,182.77
2004	11,149
2005	10,902
2006	12,020.16
2007	12,467.59
2008	7,714
2009	7,247.70
2010	7,938.5
2011	8,701.08
2012	9,194.88
2013	10,137.96
2014	10,025.68
2015	11,839.55

Volume of export and pricing status, 2002-2011		
Year	Volume (mt)	Price/kg
2002	271.8	38.00
2003	622.4	28.00
2004	311.3	28.00
2005	500	38-45.00

2006	342.816	38-45
2007	260.715	45.00
2008	-	45-50
2009	-	50-55
2010	-	50-55
2011	2.8	40-50
2013	14	40-50
2014	14	40-50

Guimaras Total Mango Production, Volume, Percent Exported and Value of the Industry

Year	Mango Production	Volume Exported	Exported	Value of Fruits Exported (PhP)	Value of Fruits Locally Sold (PhP)	Total Value of Mango Industry
2002	11,320	271,868	24	10,330,984	309,347,696	319,678,680
2003	11,182.77	622,394	56	17,427,032	295,690,528	313,117,560
2004	11,149.04	811,285	28	9,027,265	303,457,140	312,484,405
2005	10,902.00	500.00	46	17,000,000	364,075,600	381,075,600
2006	12,020.16	342,816	29	13,541,232	408,707,040	422,248,272
2007	12,467.59	260,715	21	11,732,175	473,768,842	473,768,842
2008	7,714	-	-	-	361,968,000	361,968,000
2009	7,247.70	-	-	-	362,385,000	362,385,000
2010	7,938.5	-	-	-	396,925,000	396,925,000
2011	7,971.32	2.8		-		
2013		14.0				
2014		14.0				
TOTAL	71,993.26	2,323.078				

Provincial Office for Agricultural Services, Retrieved December 20, 2016

Annex 8

Determination of Total Soluble Solids

Determination of total soluble solids

A Apparatus

1) Balance - With capacity of ≤ 2 kg and sensitivity of 0.1 g
2) High speed blender
3) Hand refractometer - With scale reading of 0° - 35° Brix

B Standardization of refractometer

Adjust instrument to read n of 1.3330 of 0 % sucrose with H20 at 20°.

C Preparation of sample

Mix representative aliquots of liquid and solid materials at same liquid-to-liquid ratio as original sample, and blend to workable paste.

Accurately weigh ca 10 g prepared paste, dissolve in equal amount of H20 at 20°C. Mix thoroughly.

D Determination

Place sufficient amount of sample on the prism of the instrument, and determine by direct reading in terms of °Brix.

Calculation is simplified by multiplying Brix of solution by 2.

Department of Trade and Industry: Bureau of Food Products. (2007). *Republic of the Philippines: Citrus Beverage Products.* DTI Philippines. Retrieved January 9, 2017 from **https://law.resource.org/pub/ph/ibr/pns.11.2007.pdf**

The Guimaras Mango with the sweetness of 16°Brix is tested through determination of Total Soluble Solid test conducted by the Bureau of Plant and Industry – Guimaras National Crop Research, Development, and Production Support Center.

Annex 9

National Seed Industry Council (NSIC) approved mango strains

Table 1. LIST OF NSIC - REGISTERED FRUIT VARIETIES (1995-2008)

Common Name	Variety Name	Registration Number	Owner and Address
Mandarin	*Gayunan*	NSIC 04 Md 01	Joseph Ganagan
			Baguio City
	Ponkan (Taiwan)	NSIC 04 Md 02	BPI-BNCRDC
			Baguio City
	Ponkan (California)	NSIC 04 Md 03	BPI-BNCRDC
			Baguio City
	Okitsu	NSIC 06 Md 04	BPI-BNCRDC
			Baguio City
Mango	*MMSU Gold*	NSIC 97 Mn 01	MMSU
			Batac, Ilocos Norte
	Fresco	NSIC 00 Mn 02	Prevada Fresco
			Aguilar, Guimaras
	Talaban	NSIC 00 Mn 03	Salvio Talaban
			Aguilar, Guimaras
	Sweet Elena	NSIC 02 Mn 04	Nida Malabed
			Sta. Cruz, Zambales
	Tanaleon	NSIC 04 Mn 05	Dominador Tanaleon
			Aguilar, Guimaras
	Guimaras Super	NSIC 04 Mn 06	Cezar Galila
			Nueva Valencia,
	Efondo	NSIC 05 Mn 07	Marciano Efondo
			Millan, Sibunag, Guimaras
	Corcino	NSIC 05 Mn 08	Roque Corcino
			7 Piddig, Ilocos Norte
	Prima	NSIC 05 Mn 09	Prima Franco
			Sinait, Ilocos Sur
	JTA Sweet	NSIC 08 Mn 10	Ma. Luz T. Animas
			San Lorenzo, Guimaras
	'P1-King Rodolfo	NSIC 08 Mn 11	Hilaria M. dela Cruz
			Sabang, Sta Cruz
Mangosteen	*UPLB Sweet*	NSIC 07 Mg 01	Dept. of Horticulture
			Crop Science Cluster,UPLB
	Roxas Purple	NSIC 06 Mg 02	Marino Roxas
			Calauan, Laguna
Marang	*Maraginto*	NSIC 96 Mr 01	USM
			Kabacan, Cotabato
Papaya	*Sinta*	NSIC 96 Pp 01	IPB-UPLB
			College, Laguna

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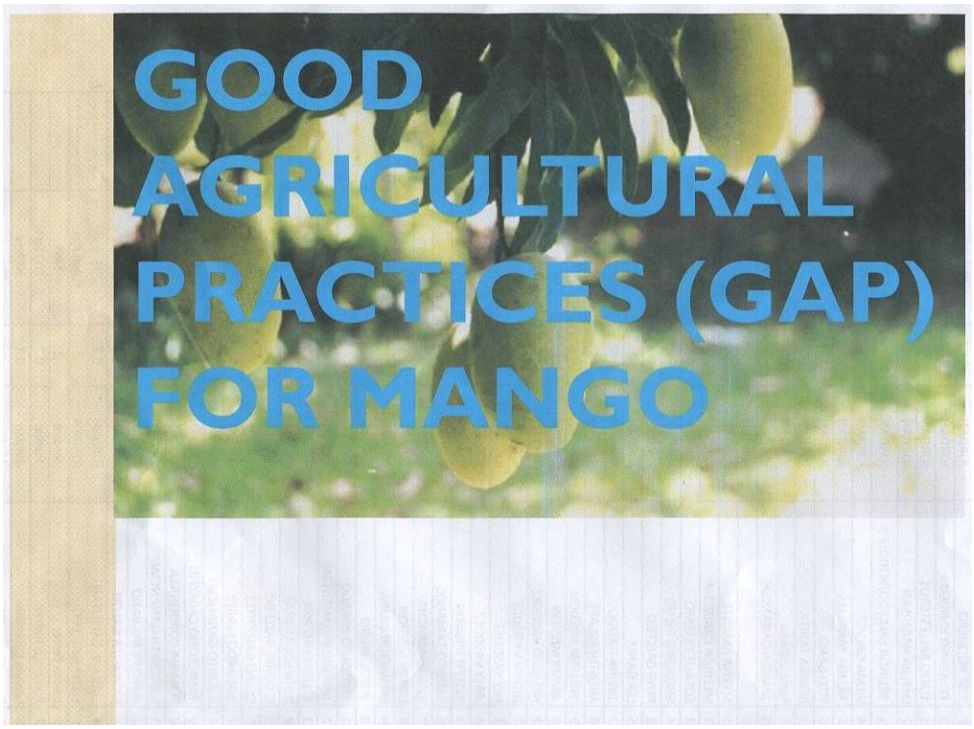
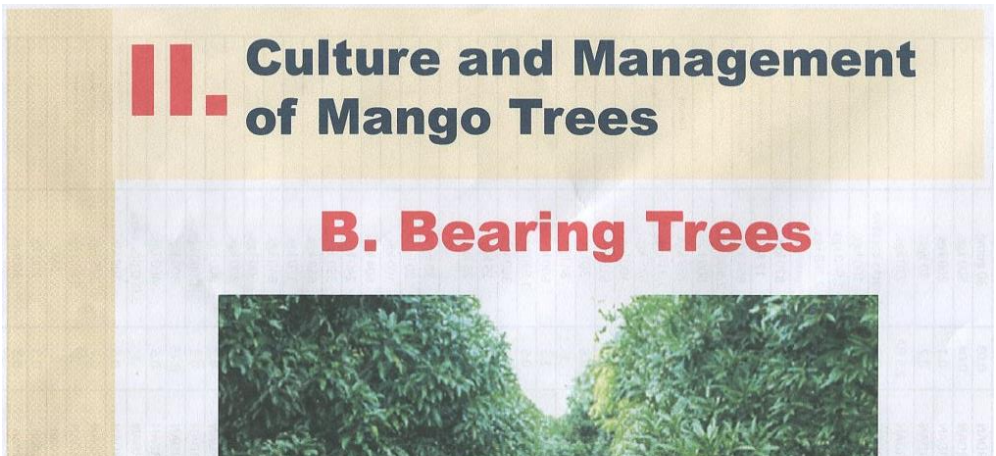
Fruit Crops Technical Working Group. (2008). *Guidelines for Evaluation, Selection and Registration of New Fruit Crop Varieties*. National Seed Industry Council. Retrieved January 9, 2017 from **http://www.nseedcouncil.bpinsicpvpo.com.ph/downloadables/nctfruit.pdf**

Annex 10

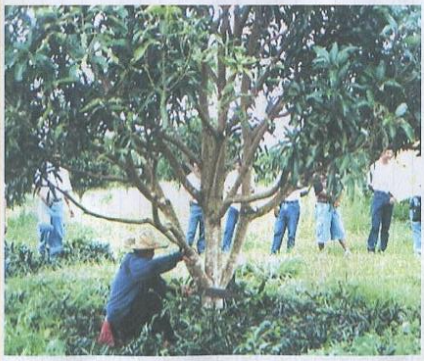
Good Agricultural Practices





1.Pruning

- Removal of dead, insect/disease infested parts and crowded branches
- Pruning should be done within the canopy
- Avoid excessive pruning on bearing trees
- Preferably done during summer months after harvest
- Drastic pruning (top working) to change the variety or rehabilitate old trees



- For big and old trees follow the drip line of the canopy
- At flowering, foliar fertilizer is recommended as supplement (18

2. Fertilization

- Soil and tissue analysis recommended
- Five to six years old = 500 g to 1 kg triple 14 or 3 to 4 kg manure + 500 g to 1 kg triple 14
- Seven to eight years old = 2 kg triple 14 or 4 to 5 kg manure + 2 kg triple 14
- Nine to ten years old = 3 kg triple 14 or 5 to 6 kg manure + 3 kg triple 14
- 11 to 15 years = 5 kg triple 14 + 10 kg manure

- 16 – 20 years = 6 to 7 kg triple 14 + 12 kg manure
- Above 20 years = 10 kg triple 14 + 15 to 20 kg manure
- Soil fertilizer maybe applied once or twice at the start and before the end of rainy season
- Fertilizer can be placed in canal, constructed around the tree, 1 m radius from the trunk and 15 to 30 cm deep or 6 to 8 holes are recommended.

Bureau of Plant Industry - Guimaras National Crop Research, Development, and Production Support Center (BPI-GNCRDPSC), Retrieved January 10, 2017

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Intellectual Property Center, 28 Upper McKinley Rd.
McKinley Hill Town Center, Fort Bonifacio, Taguig City 1634, Philippines
Tel. No. 238-6300 Website: http://www.ipophil.gov.ph e-mail: mail@ipophil.gov.ph
Publication Date **: 12 April 2023**

CERTIFICATION FROM THE CONCERNED GOVERNMENT AGENCY OR EQUIVALENT INDEPENDENT BODY

REPUBLIC OF THE PHILIPPINES
PROVINCE OF GUIMARAS
PROVINCIAL OFFICE FOR AGRICULTURAL SERVICES
San Miguel, Jordan, Guimaras

CERTIFICATION

(1)This certifies that there is a causal link between the geographical area and topography of Guimaras Island which varies from flat to steeply sloping, with land elevation ranging from 0 to nearly 300 meters above sea level. The moderately undulating and rolling to steeply sloping topography and elevation of the island is highly suited for growing "Carabao" Guimaras mangoes.

The combination of calcareous and loamy soils contributes to the good quality of the Guimaras mango. Gravelly loam is the major soil type, comprising about 71.85% of the total land area of Guimaras. This is a residual soil from diuretic and basaltic rocks. Its surface soil is brown to grayish brown fine sandy loam to gravelly loam and structureless. Concretions are present and its depth is 20-25 centimetres. Its subsoil is light brown fine sand, slightly compact and structureless. Concretions and gravels are abundant and its depth is 25-80 centimeters from the surface.

The mango tree has a very deep and strong root system; thus, a deep soil is ideal for easy penetration and spread of the root system. Deep and well-drained soils allow for good depth and distribution of the root system, producing trees of standard size, high yields and long life. Its substratum is dark brown fine sand, structureless, slightly compact and with gravels present. The presence of a substratum of loose gravel helps in providing good drainage.

(2) This certifies that the causal link between the geographical area and the sweetness, firmness of the flesh as well as absence of fiber in the flesh of Guimaras Fresh Mango indicated in its Manual of Specification/Code of Practice is accurate and true.

November 16, 2022

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