

## HAWAII GRADING STANDARDS FOR MANGOS

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Throughout this conference you have heard speakers stress the need to maintain quality in the mangos that you market. Grade standards, certification, and enforcement are some of the ways the Department of Agriculture can assist the industry in assuring that quality fruit reaches the market.

The Commodities Branch establishes grade standards in cooperation with the industry, enforces grade labeling and minimum export requirements desired by the industry, and provides certification of commodities on a fee-for-service basis when requested by a financially interested party. The branch can perform these functions for both fresh and processed products. Because the commercial market for Hawaii-grown mangos has not been developed, you have probably had little contact with our program.

Let's look at why we have quality and condition grades:

1. They establish standards that are widely recognized.
2. They serve as the guidelines for communication between buyers and sellers of a product.
3. They allow the sale of goods by sample or description, sight unseen.
4. They improve the efficiency of the marketing system.
5. They allow for more meaningful price quotations, because there is a more direct relationship of price to quality.
6. They allow consolidation of products for shipment to reduce transportation and handling costs.
7. They may increase consumer demand based on greater consumer confidence in the product due to quality consistency.
8. They contribute to faster and more satisfactory settlement of loss or damage claims.
9. They permit consumers to communicate their preferences back to the producers.
10. They may serve as a standard for regulatory action if industry desires.

The standards for grades of Hawaii-grown mangos were first adopted in 1954 and have not

changed substantially since then. There have never been any grade standards adopted for mango products.

Internationally there has recently been action taken by the Codex Alimentarius Commission, FAO-WHO, to establish international standards for mangos. These standards may have an effect on the market when the North American Free Trade Agreement takes effect. The September 1991 draft of these standards and the May 1992 amendment are given in Appendix 1. We believe that these are the latest proposals and that they have not yet been adopted. The current Hawaii grade standards for mangos are given in Appendix 2.

In developing the requirements for grade standards the state takes its guidance from the wishes of the majority of the industry. The industry includes not only the growers and the handlers but also the wholesalers, retailers, and consumers.

The following steps are necessary to develop or update standards:

1. The industry submits a request either to develop or update grade standards to the Department of Agriculture. The DOA may also query the industry to see if they desire changes, if no request for changes have come in for an extended period of time.
2. The industry should appoint a standardization committee to work with the DOA staff to avoid miscommunication, confusion, and duplication of effort. Working through a standardization committee has, in the past, proven to be the most effective procedure.
3. The DOA meets with the standardization committee or industry representatives to draft tentative standards. This step may take an extended period of time, depending on the level of advanced preparation by the standardization committee.
4. The tentative standards are field tested to evaluate their effectiveness and determine whether they are practical. This step may be eliminated if minor revisions are being made or timing is critical.

5. If the tests show positive results, the proposed standards are presented to all known members of the industry for their review, comments, and indication of acceptance or rejection.

6. If the majority of the industry indicates approval of the standards as proposed, the State of Hawaii administrative procedures are followed to adopt the standards as rules. This involves preliminary Board of Agriculture and Governor's approval, advertisement, public hearings with testimony, final BOA and Governor's approval, and filing with the Office of the Lieutenant Governor. This last step can take up to six months.

An important point to remember is that after the grade standards have been adopted as rules they have the force of law and cannot be changed without going through the formal procedures. Because of this, the implications of any change to grades must be thoroughly evaluated before the change is made.

The Hawaii grade standards for mangos have not been extensively used, because there has not been a large commercial market for mangos. If the industry feels that there have been substantial changes in the varieties of fruit marketed or that changes are needed to expand the potential for growth in the local or export market, then there is a need to investigate revising the standards. It must be remembered that grade standards should set the basis for quality and condition; they should not try to solve specific marketing problems.

If this is the desire of the industry, then a standards committee should be set up to look at the existing grade standards and the minimum export requirements for mangos. This committee should have a serious commitment to reviewing the grade standards in a reasonable length of time. The committee should be prepared to make recommendations for the basic requirements that meet the needs of the whole industry under the current production methodology, quarantine requirements, packing, transportation, and marketing practices, and the markets served. The committee also has to recognize the regulatory viewpoint that grade standards need to be easily enforceable without undue cost to the industry through lost time, cost of inspection, or product destruction.

#### **Administrative Procedures for Adopting Standards**

1. The standards are drafted in Ramseyer and

standard formats.

2. The language of the proposed standards is reviewed by the Office of the Attorney General and the format is reviewed by the Revisor of Statutes.

3. Preliminary approval is obtained from the Board of Agriculture to conduct public hearings on the proposed standards.

4. Approval is obtained from the Governor to conduct public hearings on the proposed standards.

5. A notice of public hearing is prepared, approved by the Office of the Attorney General, and published in the newspapers of all affected counties.

6. The public hearings are held no sooner than 30 days after the publication of the notice of public hearing. Verbal and written testimonies are accepted at the hearings. Written testimony may be submitted for at least five days after the last public hearing.

7. Following the hearing, the hearing officer submits a report to the Board of Agriculture. This report includes all verbal and written testimony and recommendations on the action to be taken by the board.

8. If the Board of Agriculture approves adoption of the standards without substantive changes, they are submitted to the Governor for approval and signature. If substantive changes are proposed as a result of the public hearing, a new notice of public hearing must be published and another series of hearings must be held.

9. The rules are filed with the Office of the Lieutenant Governor and become effective 10 days later.

#### **Length of Time to Amend Rules**

It takes at least 180 days from the time that the workable language for the grade standard is finalized.

The time may be increased depending on time delays in review at the Office of the Attorney General or at the Governor's office. Delays may also arise if the timing is not right to meet the monthly Board of Agriculture meeting.

#### **Notice of Hearing and Public Hearing**

The notice of hearing is published in a newspaper of general circulation (*Star Bulletin* or *The Honolulu Advertiser*) and in a paper in each county. If the commodity is of particular importance to Molokai or Kona subdistricts, the notice may also be published in their local

newspapers.

Public hearings are held in each county affected by the rule change. (Honolulu, Kahului/Wailuku, Lihue, and Hilo). If the commodity is important to Molokai or Kona, hearings are also held in those areas.

The hearings are usually held in the evening for the convenience of the working farmer.



Q: Is there a federal U.S. standard for mangos?

A: No. The only one I could find is the international standard from Codex. Dr. Davenport tells me that in Florida there is an industry agreement about what to pack, and in Mexico there are no established standards. We may have the only mango standards other than the Codex standards. The U.S. could establish standards for mangos imported from other countries. USDA recognizes our standards as the standards for Hawaii mangos. Other states could ask other countries to ship mangos that conform to the Hawaii standards; they couldn't call them "Hawaii No. 1," but they could ask them to meet the standards.

Q: I often see green mangos on sale in Chinatown. Would they be in the category "nongraded"?

A: They would be "off grade." It is not mandatory that you put the grade on the fruit, but if you use the grade, it must meet the grade. If you make no claim, it is up to the consumer to evaluate the product and decide if the price is right for what they are getting.

Q: Where does the DOA get involved with grading: in the field, on the shelf?

A: There is no mandatory grade labeling. We would assist the farmer by teaching how to grade the product if, for example, the grower was being asked to provide fruit meeting a certain standard. We would enter into an enforcement mode if the producer or wholesaler started to write the grade down on the box. If it didn't meet the grade, we could act against them for not labeling it properly. We would also enter into the transaction if the wholesaler had asked for a grade from the farmer and didn't think they were getting that grade; we would become the arbiter, and we charge for that. All our other activities are free, but if you ask for a certificate, we charge for that. If you are not shipping to stated grade standard, that certificate can be used to make a claim against you. Also, if you ship your mangos out of state and ship No. 2 mangos, we would stop you from doing that, because our minimum export standard is No. 1.

DRAFT WORLDWIDE CODEX STANDARD  
FOR MANGOES  
(At Step 8)

1. DEFINITION OF PRODUCE

This standard applies to commercial varieties of mangoes grown from *Mangifera indica* L. of the Anacardiaceous family to be supplied fresh to the consumer, after preparation and packaging. Mangoes for industrial processing are excluded. (1)

2. PROVISIONS CONCERNING QUALITY

2.1 Minimum Requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the mangoes must be:

- whole;
- firm;
- fresh in appearance;
- sound; produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- clean, practically free from any visible foreign matter;
- free from black necrotic stains or trails;
- free from marked bruising;
- practically free from damage caused by pests;
- free from damage caused by low temperature;
- free from abnormal external moisture, excluding condensation following withdrawal from cold storage;
- free of any foreign smell and/or taste;
- sufficiently developed and display satisfactory ripeness;
- when a peduncle is present, it shall be no longer than 1.0 cm.

The development and condition of the mangoes must be such as to enable them to ensure a continuation of the maturation process until they reach the appropriate degree of maturity corresponding to the varietal characteristics, to withstand transport and handling, and to arrive in satisfactory condition at the place of destination.

In relation to the evolution of maturing, the colour may vary according to variety.

2.2 Classification

Mangoes are classified in three classes defined below:

2.2.1 "Extra Class"

Mangoes in this class must be of superior quality. They must be characteristic of the variety.

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(1) Governments, when indicating the acceptance of the Codex Standard for mango, should notify the Commission which provisions of the standard would be accepted for application at the point of import, and which provisions would be accepted for application at the point of export.

They must be free from defects with the exception of very slight superficial defects, provided that these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

### 2.2.2 Class I

Mangoes in this class must be of good quality. They must be characteristic of the variety. However, the following slight defects may be allowed provided that these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- slight defects of shape;
- slight defects of the skin due to rubbing or sunburn, suberized stains due to resin exudation (elongated trails included) and healed bruises not exceeding 3, 4, 5 cm<sup>2</sup> for size groups A, B, C respectively.

### 2.2.3 Class II

This class includes mangoes which do not qualify for inclusion in the higher class, but satisfy the minimum requirements specified in Section 2.1 above.

The following defects may be allowed provided that the mangoes retain their essential characteristics as regards the quality, the keeping quality and presentation:

- defects of shape;
- defects of skin due to rubbing or sunburn, suberized stains due to resin exudation (elongated trails included) and healed bruises not exceeding 5, 6, 7 cm<sup>2</sup> for size groups A, B, C respectively.

In classes I and II, scattered suberized rusty lenticels, as well as yellowing of green varieties due to exposure to direct sunlight, not exceeding 30 percent of the surface and not showing any signs of necrosis are allowed.

## 3. PROVISIONS CONCERNING SIZING

Size is determined by the weight of the fruit. Mangoes are sized according to the following size groups:

<u>Reference Letter</u>	<u>Weight in Grammes</u>
A	200-350
B	351-550
C	551-800

The maximum permissible difference between fruit in the same package belonging to one of the above mentioned size groups shall be 75, 100 and 125 g. respectively.

The minimum weight of mangoes must not be less than 200 grammes.

## 4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each package for produce not satisfying the requirements of the class indicated.

#### 4.1 Quality Tolerances

##### 4.1.1 "Extra Class"

Five percent of the number or weight of mangoes not satisfying the requirements of the class, but meeting those of class I or, exceptionally, coming within the tolerance of that class.

##### 4.1.2 Class I

Ten percent by number or weight of mangoes not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

##### 4.1.3 Class II

Ten percent by number or weight of mangoes satisfying neither the requirements of the class nor the minimum requirements, with the exception of fruit affected by rotting, marked bruising or any other deterioration rendering in unfit for consumption.

#### 4.2 Size Tolerances

For reference letter A, 10 percent by number or weight of mangoes less than 200 grammes with a minimum weight of 180 grammes. For reference letter B, 10 percent by number or by weight of mangoes. For reference letter C, 10 percent by number or weight of mangoes greater than 800 grammes with a maximum weight of 925 grammes.

The 10 percent tolerance for off-size mangoes may vary above or below the weight range of the specified size group by one-half the difference between the sizes in the group.

#### 5. PROVISIONS CONCERNING PRESENTATION

##### 5.1 Uniformity

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

##### 5.2 Packaging

Mangoes must be packed in such a way as to protect the produce properly.

The material used inside the packages must be new, clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications, is allowed provided the printing or labelling has been done with non-toxic ink or glue.

Mangoes shall be packed in each container in compliance with the Code of Practice for Packaging and Transport of Tropical Fresh Fruits and Vegetables.

##### 5.2.1 Description of Containers

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the mango. Packages (or lot is product is presented in bulk) must be free of all foreign material and smell.

6. MARKING OR LABELLING

6.1 Containers destined for the final consumer:

In addition to the requirements of the Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985) the following specific provisions apply.

6.1.1 Origin of the Produce

If the product is not visible, each package shall be labelled as to the name of the food and may be labelled as to the name of the variety.

6.2 Non retail containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked and visible from the outside, or in the documents accompanying the shipment (2).

For products transported in bulk these particulars must appear on a document accompanying the goods.

6.2.1 Identification

Exporter, Packer and/or Dispatcher.

6.2.2 Nature of Produce

Name of produce if the contents are not visible from the outside.  
Name of variety or commercial type (if applicable).

6.2.3 Origin of Produce

Country of Origin and optionally, district where grown or national, regional or local place name.

6.2.4 Commercial Identification

- Class
- Size (Reference letter or weight range)
- Number of units (optional)
- Net weight (optional).

6.2.5 Official Inspection Mark (optional)

7. CONTAMINANTS

7.1 Pesticide Residues

Produce shall comply with those maximum residue limits established by the Codex Committee on Pesticide Residues for this commodity (see CAC/VOL. XIII - Ed. 2, Supplements 1 and 2).

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(2) Governments, when indicating their acceptance of this Codex Standard, should notify the Commission as to which provisions of this section apply.

Plenary Meeting of the OECD Scheme for the Application of International Standards for Fruit and Vegetables. 46th Session. Paris. 25-27 May 1992

a) Draft Explanatory Brochure on the Standard for Mangoes

To improve comprehension in the last paragraph of the standard, referring to the definition of Class II, the Plenary Meeting agreed to propose a new text to the UN/ECE Secretariat for follow-up, namely:

"In Classes I and II, the following conditions are also allowed:

- scattered rusty lenticels;
- yellowing of green varieties due to exposure to direct sunlight, not exceeding 40 percent of the surface, excluding necrotic stains."

Furthermore, in order to harmonise presentation of the standards, the Meeting agreed to request that the paragraph on minimum weight be placed immediately after the sentence on sizing.

## Hawaii Grading Standards for Mangos. Appendix 2: Description of the Hawaii Standard.

Hawaii Department of Agriculture  
Marketing and Consumer Services Division  
Commodities Branch

March 24, 1986

### STANDARDS FOR HAWAII-GROWN MANGOES\*

This UNOFFICIAL COPY of standards for mangoes, rewritten for easy interpretation, is based on Chapter 4-41, Hawaii Administrative Rules, Standards for Fresh Fruits and Vegetables. The general provisions of this Chapter, summaries of standards for other fruits and vegetables, and official copies of the complete chapter are available in each county.

<u>HAWAII FANCY (GRADE AA)</u>	<u>HAWAII NO. 1 (GRADE A)</u>	<u>HAWAII NO. 2 (GRADE B)</u>
<u>Basic Requirements</u>	<u>Basic Requirements</u>	<u>Basic Requirements</u>
Single variety	Single variety	Single variety
Mature (1)	Mature (1)	Mature (1)
Not overripe (2)	Not overripe (2)	Not overripe (2)
Clean (3)	Clean (3)	Clean (3)
Well trimmed (4)	Well trimmed (4)	Well trimmed (4)
Well formed (5)	Fairly well formed (6)	Not badly misshapen (7)
Smooth (8)	Smooth (8)	Smooth (8)
Small seeded (9)	Small seeded (9)	Small seeded (9)
<u>Free From</u>	<u>Free From</u>	<u>Free From</u>
Anthraxnose or other decay	Anthraxnose or other decay	Decay (except anthracnose)
Wormholes	Wormholes	Wormholes
Insect stings (10)	Insect stings (10)	Insect stings (10)
Freezing injury	Freezing injury	Freezing injury
Bruises (11)	Bruises (11)	Bruises (11)
Cuts	Cuts	Cuts
Punctures	Punctures	Punctures
Cracks	Cracks	
		<u>Free From Injury (12)</u>
<u>Free From Injury (12)</u>	<u>Free From Injury (12)</u>	<u>Caused By</u>
<u>Caused By</u>	<u>Caused By</u>	Fibre
Fibre	Fibre	
Discoloration		<u>Free From Serious Damage (14)</u>
Russeting	<u>Free From Damage (13)</u>	<u>Caused By</u>
Scars	<u>Caused By</u>	Discoloration
Disease	Discoloration	Russeting
Insects	Russeting	Scars
Mechanical or other means	Scars	Disease
	Disease	Insects
	Insects	Anthraxnose
	Mechanical or other means	Cracks
		Mechanical or other means

\*Numbers in parentheses following grade terms indicate where such terms are defined under "Definitions."

Size Requirement

A numerical count or minimum diameter (15) or size classification shall be used to describe the size of mangoes in any container.

When the numerical count is specified, the diameter of the largest mango in any container shall not exceed the diameter of the smallest mango by more than 1/2 inch when most of the mangoes are 3 inches or larger in diameter, nor by more than 3/8 inch in diameter when most of the mangoes are less than 3 inches in diameter.

Size classifications which may be used to specify size in connection with the grade are as follows:

Small	Under 2-1/2 inches in diameter
Medium	2-1/2 to 3 inches in diameter
Large	Over 3 inches in diameter

<u>Tolerances (count basis)</u>	<u>Tolerances (count basis)</u>	<u>Tolerances (count basis)</u>
Defects: Total 10%; provided not more than 5% damage and anthrac- nose, including 1% decay other than anthracnose.	Defects: Total 10%; provided not more than 5% serious damage and anthracnose, including 1% decay other than anthracnose.	Defects: Total 10%; provided not more than 1% decay other than anthracnose.
Off-size: Total 10%.	Off-size: Total 10%.	Off-size: Total 10%.

OFF-GRADE. "Off-Grade" is not a grade within the meaning of these standards, but is a descriptive term applicable to mangoes which have a market value, and designates a quality lower than the lowest applicable Hawaii, other states or the United States grade for mangoes.

APPLICATION OF TOLERANCES. Averages for the entire lot, based on examination of representative samples, shall be within the tolerances specified, but the contents of individual containers in any lot may vary from the specified tolerances subject to the following limitations:

When the tolerance specified is more than 5 percent, individual packages in any lot may contain not more than 1-1/2 times the tolerance, provided that at least one specimen which fails to meet the requirements shall be permitted in any container.

When the tolerance specified is 5 percent or less, individual packages in any lot may contain not more than double the tolerance, provided that at least one specimen which fails to meet the requirements shall be permitted in any container.

APPLICABLE GRADE TERMS. Mangoes shall be classified in accordance with the grading system designated below:

Wholesale Quantities - HAWAII FANCY, HAWAII NO. 1 or HAWAII NO. 2,  
whichever is applicable.

Consumer Packages  
and Bulk Displays - HAWAII GRADE AA, HAWAII GRADE A or HAWAII GRADE B,  
whichever is applicable.

MINIMUM EXPORT GRADE. Mangoes for export shall at least meet the requirements of Hawaii No. 1 mangoes.

DEFINITIONS.

- (1) "Mature" means the mango has reached the stage of growth which insures a proper completion of the ripening process.
- (2) "Overripe" means dead ripe, very soft and past commercial utility.
- (3) "Clean" means practically free from dirt, dust, spray residue or other foreign matter and the amount of sap on the fruit is not excessive.
- (4) "Well trimmed" means the stem is neatly and smoothly cut or broken off at a point not more than 1/2 inch beyond the shoulder of the fruit.
- (5) "Well formed" means the mango has a shape typical of the variety and is symmetrical and without irregularities in shape.
- (6) "Fairly well formed" means the mango may be slightly abnormal in shape, but not to an extent whereby its appearance is materially affected.
- (7) "Badly misshapen" means the mango is seriously irregular or abnormal in shape.
- (8) "Smooth" means there are no ridges, grooves or other irregularities of the skin of the fruit. Rough scars or cracks shall not be considered a factor of smoothness.
- (9) "Small seeded" means the weight of the seed in any fruit does not exceed 25 percent of the total weight of the fruit.
- (10) "Insect stings" means punctures made by insects that can be identified as such with the naked eye without cutting the fruit.
- (11) "Bruises" means bruising injury other than those incident to proper handling and packing.
- (12) "Injury" means any specific defect described in Table 1, Classification of Defects; or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects which appreciably detracts from the appearance, or the edible or shipping quality of the mangoes.
- (13) "Damage" means any specific defect described in Table 1, Classification of Defects; or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects which materially detracts from the appearance, or the edible or shipping quality of the mangoes.
- (14) "Serious damage" means any specific defect described in Table 1, Classification of Defects; or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects which seriously detracts from the appearance, or the edible or shipping quality of the mangoes.

(15) "Diameter" means the distance across the smallest round opening through which the mango will pass without pressure.

Table 1. Classification of Defects

FACTOR	INJURY	DAMAGE	SERIOUS DAMAGE
Fibre	Flesh of fruit fibrous in areas not immediately adjacent to the seed; or fibres normally present in areas immediately adjacent to the seed are so long as to appreciably affect palatability.		
Discoloration	Aggregating an area more than 3/8 inch in diameter.	Aggregating an area more than 2-1/2 percent of the surface.	Affecting more than 1/3 of the surface.
Russeting or scars	Light colored, smooth and aggregating and area more than 3/8 inch in diameter; rough scaly, dark or prominent and aggregating an area more than 1/8 inch in diameter; or affected area is sunken.	Light colored, smooth and aggregating an area more than 10 percent of the surface; rough, scaly, dark or sunken and aggregating an area more than 1/2 inch in diameter; or so deep as to materially affect appearance.	Rough, scaly, dark or prominent and aggregating an area more than 1-1/2 inches in diameter; or so deep as to seriously affect appearance.
Anthraco nose			Any single spot more than 1/8 inch in diameter; or when affected areas aggregate more than 1/2 inch in diameter.
Cracks			Unhealed; not shallow; or affecting an aggregate area more than 1 inch in diameter.