



THAI AGRICULTURAL STANDARD

TAS 13-2007

PUMMELO

**National Bureau of Agricultural Commodity and Food Standards
Ministry of Agriculture and Cooperatives**

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National Bureau of Agricultural Commodity and Food Standards

Ministry of Agriculture and Cooperatives

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Thailand has been producing pummelos in great quantity and the export is potentially increasing. The establishment of a standard for pummolos is significant to assist promoting the development of quality production. Encouragement of high quality fruit production in accordance with the standard will have the outcome that Thai pummelos will be better accepted by both the domestic and international trade. It also provides consumers' safety and promotes the export. The Ministry of Agriculture and Cooperatives deems it proper to establish a standard for pummolos.

The provisions of this Thai Agricultural Standard are based upon illustrations from a project on study and illustration presentation indicating quality characteristics of the fruit added to the Thai Agricultural Standard for Pummelos of the National Bureau of Agricultural Commodity and Food Standards. The operation was cooperated by the Faculty of Agriculture, Kasetsart University; and the following documents are used as guideline.

Remark:

The standard title has been revised from “Thai Agricultural Commodity and Food Standard (TACFS X-XXXX)” to “Thai Agricultural Standard (TAS X-XXXX)” in accordance with the application of the Agricultural Standards Act B.E. 2551 (2008).



**NOTIFICATION OF THE NATIONAL COMMITTEE ON
AGRICULTURAL COMMODITY AND FOOD STANDARDS
SUBJECT: THAI AGRICULTURAL COMMODITY AND FOOD STANDARD:
PUMMELO
B.E. 2550 (2007)**

The resolution of the 1/2550 session of the National Committee on Agricultural Commodity and Food Standards dated 2 May B.E. 2550 (2007) endorsed the Thai Agricultural Commodity and Food Standard entitled Pummelo for the benefit of development of agricultural commodity and food which is safe and in accordance with the standard.

By virtue of the Cabinet Resolution on Appointment and Authorization of the National Committee on Agricultural Commodity and Food Standards dated 3 April B.E. 2550 (2007), the Notification on Thai Agricultural Commodity and Food Standard entitled Pummelo is hereby issued as voluntary standard, the details of which are attached herewith.

Notified on 2 May B.E. 2550 (2007)

Mr. Theera Sutabutra

Minister of Agriculture and Cooperatives

Chairperson of the National Committee on Agricultural Commodity and Food Standards

THAI AGRICULTURAL STANDARD

PUMMELO

1 DEFINITION OF PRODUCE

This standard applies to commercial varieties of “Pummelos” grown from *Citrus maxima* Merr. [syn. *C. grandis* (L.) Osbeck] of the Rutaceae family, to be supplied fresh to the consumer.

2 PROVISIONS CONCERNING QUALITY

2.1 MINIMUM REQUIREMENTS

2.1.1 In all classes (2.2), subject to the special provisions for each class and the tolerances allowed, the pummelos must be:

- (1) whole;
- (2) firm flesh;
- (3) fresh appearance;
- (4) practically free of rotting and bruising or deterioration such as to make it unfit for consumption;
- (5) clean, practically free of any visible foreign matter;
- (6) free of abnormal external moisture, excluding condensation following removal from cold storage;
- (7) practically free of pests affecting the general appearance of the produce;
- (8) practically free of produce damage caused by pests affecting the general appearance of the produce and the acceptance of the consumer;
- (9) free of damage caused by low and/or high temperature affecting the general appearance of the produce and the acceptance of the consumer;
- (10) free of any foreign smell and /or abnormal taste.

2.1.2 The pummelos must be properly mature, appropriate to the variety and geographical location. They must be carefully harvested, postharvest handled and transported in order to obtain the produce in acceptable condition on arrival at the destination.

2.1.3 Determination on the proper maturity of pummelos may be carried out from any characteristics of the following:

- (1) Total soluble solid content or sweetness not less than 8.0 degrees Brix.
- (2) Skin color of the fruit is fading by at least two thirds of the total fruit skin which is normal of the variety or the area between oil glands at the stylar end is obviously expanding.

2.2 CLASSIFICATION

Pummelos is classified in 3 classes defined below:

2.2.1 Extra Class

Pummelos in this class must be of superior quality and characteristics of the variety. They must be properly mature. In the segment there are juice sacs which must be normal in physiology. They are not cloudy white, hard nor rather dry of which called granulation. The fruits must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the internal quality, the keeping quality and presentation in the package.

2.2.2 Class I

Pummelos in this class must be of good quality and characteristics of the variety. Slight defects may be allowed, provided these do not affect the general appearance of the produce, the internal quality, the keeping quality and presentation in the package. The total defects do not exceed 10% of the total surface area which does not at any rate affect the produce quality of the following categories:

- (1) defects in shape,
- (2) defects in skin coloring¹,
- (3) skin defect at the early stage of fruit formation,
- (4) scars from healed lesions.

2.2.3 Class II

This class includes pummelos which do not qualify for inclusion in the higher classes, but satisfy the minimum requirement specified in Section 2.1 above. Slight defects may be allowed that the produce still retain its quality, the keeping quality and presentation in the package. The total defects do not exceed 15% of the total surface area which does not at any rate affect the produce quality of the following categories:

- (1) defects in shape,
- (2) defects in skin coloring¹,
- (3) skin defect at the early stage of fruit formation,
- (4) scars from healed lesions.

3 PROVISIONS CONCERNING SIZING

Pummelo size² is either determined by weight (Table1) or diameter at the widest equatorial part of the fruit or by fruit's circumference (Table2) as the following:

¹ Faded color at the contact area of two fruits is not considered as defect.

² The objective of this standard: There is no relation between pummelo size and classification; hence size code in Table1 and 2 can be classified into Extra Class, Class I or Class II; if it is in accordance with the classification in Section 2

Table 1. Pummelo Size by Weight.

Size Code	Weight per Fruit (g)
1	>1900
2	>1700 to 1900
3	>1500 to 1700
4	>1300 to 1500
5	>1100 to 1300
6	> 900 to 1100
7	> 700 to 900
8	400 to 700

Table 2. Pummelo Size by Diameter in Cross Section or by Circumference.

Size Code	Diameter		Circumference	
	(inch)	(mm)	(inch)	(mm)
1	>7	>170	>21.10	>536
2	>6.20 to 7.00	>159 to 170	>19.4 to 21.10	>493 to 536
3	>5.90 to 6.20	>151 to 159	>18.5 to 19.4	>470 to 493
4	>5.60 to 5.90	>143 to 151	>17.5 to 18.5	>445 to 470
5	>5.30 to 5.60	>135 to 143	>16.6 to 17.5	>422 to 445
6	>4.90 to 5.30	>126 to 135	>15.0 to 16.6	>396 to 422
7	>4.60 to 4.90	>117 to 126	>14.5 to 15.0	>368 to 396
8	3.90 to 4.60	100 to 117	12.3 to 14.5	313 to 368

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 by number or weight of pummelos not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of Class I.

4.1.2 Class I

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

4.1.3 Class II

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

4.2 SIZE TOLERANCES

For all classes and all size codes, 10% by number or weight of pummelos corresponding to the size immediately above or below that indicated on the package.

5 PROVISIONS CONCERNING PRESENTATION

5.1 UNIFORMITY

The pummelos of each package must be uniform by presented in the respect of quality, size and color. The visible part of the contents of the package must be representative of the entire contents.

5.2 PACKAGING

Pummelos must be packed in such a way to protect the produce properly. The material used inside the packages must be 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 labeling has been done with non-toxic ink or glue.

5.3 DESCRIPTION OF CONTAINER

The containers must meet the quality, hygiene, ventilation and be free of smell and all foreign matter; and have resistance characteristics to ensure suitable shipping and preserving of the pummelos.

6 MARKING OR LABELLING

6.1 CONSUMER PACKAGES

Each package shall bear the following particulars, legibly marked, and without false or deceptive information.

(1) Nature of the Produce

If the produce is not visible from the outside, each package shall be labeled with the name of the produce "Pummelo" and "Variety".

(2) Net weight in grams or kilograms

(3) Distributor information

Name and address of the producer or packer produced or distributor or head office of producer in the country. Name and address of importer for imported pummelos.

(4) Origin of produce

Country of origin, except it is produced for domestic distribution.

6.2.1 NON-RETAIL CONTAINERS

Each package must bear the following particulars, in the documents accompanying the shipment, in the label or on package, with legibly, indelibly marked and without false or deceptive information.

(1) Nature of Produce

If the produce is not visible from the outside, each package shall be labeled with the name of the produce "Pummelo" and "Variety".

(2) Class;

(3) Size, if the produce is classified size or count by the number of fruits per container

(4) Net weight in grams or kilograms

(5) Distributor information

Name and address of the producer or packer produced or distributor or head office of producer in the country. Name and address of importer for imported pummelos.

(6) Origin of produce

Country of origin, except it is produced for domestic distribution.

(7) Language

Label of produce must be in Thai Language. Produce label for export can be in any language.

6.3 OFFICIAL INSPECTION MARK OR CERTIFICATION MARK

Comply with the provisions and condition of the inspection or certification agency recognized by Ministry of Agriculture and Cooperatives of Thailand.

7 CONTAMINANTS

Comply with the provisions of relevant regulations and the Thai Agricultural Standard on Contaminant.

8 PESTICIDE RESIDUES

Comply with the provisions of relevant regulations and the Thai Agricultural Standard on Pesticide Residues.

9 HYGIENE

Harvesting, various steps of the pummelo handling including storage and transportation must be hygienically carried out in order to prevent any contaminations which will create hazard to the consumer.

11 METHODS OF ANALYSIS AND SAMPLING

Comply with the provisions of relevant regulations and the Thai Agricultural Standard on Methods of Analysis and Sampling.

ANNEX A

PUMMELO FRUIT ILLUSTRATION



Fig.1. Area between oil glands is clearly magnified.



Fig.2. Pummelo segment containing “juice sac”.

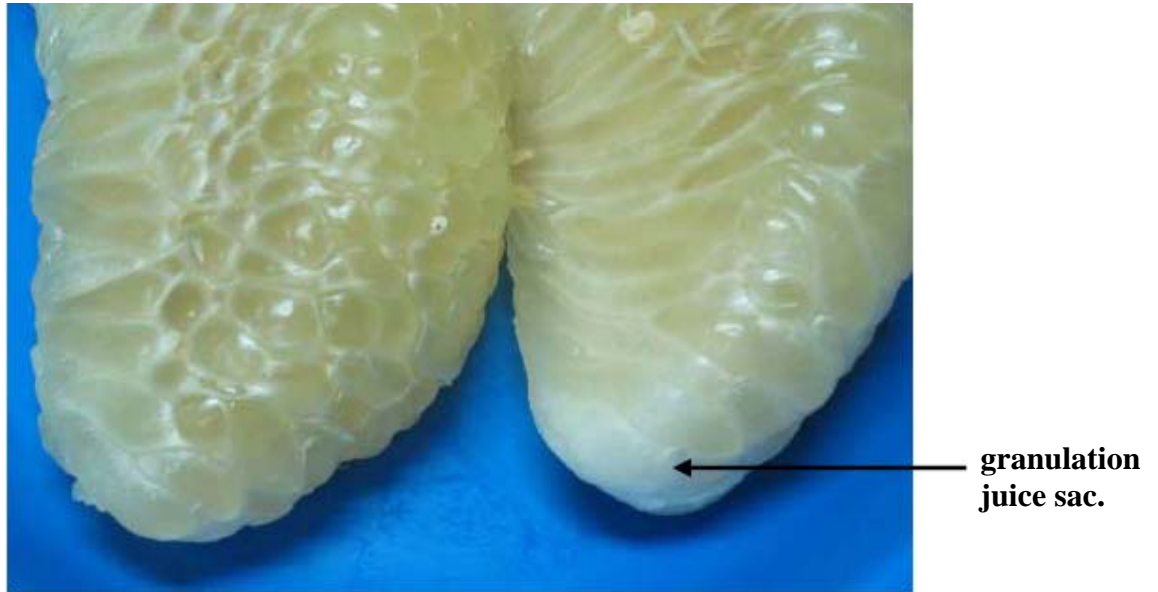


Fig.3. Characteristics of juice sac which is cloudy white, hard and rather dry called “granulation”.



Fig.4. Characteristics of granulation and normal juice sacs.



Fig.5. Color defect.



Fig.6. Various kinds of defect (not acceptable).



Fig.7. Fruit damage due to plant pest (sooty mold).

ANNEX B**UNIT**

The units and symbols used in this standard and the units recognized by the International System of Units (*le Système International d'Unités*) or SI are as follows:

Measurement	Unit	Symbols
Weight	gram	g
Length	millimeter	mm