

Citrus Fruit Quality Standards (Codex & UNECE)

Mexico

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MINISTERIO
DE INDUSTRIA, TURISMO
Y COMERCIO

SECRETARÍA DE ESTADO DE COMERCIO EXTERIOR
DIRECCIÓN GENERAL DE COMERCIO E INVERSIONES
SUBDIRECCIÓN GENERAL DE INSPECCIÓN, CERTIFICACIÓN
Y ASISTENCIA TÉCNICA DEL COMERCIO EXTERIOR

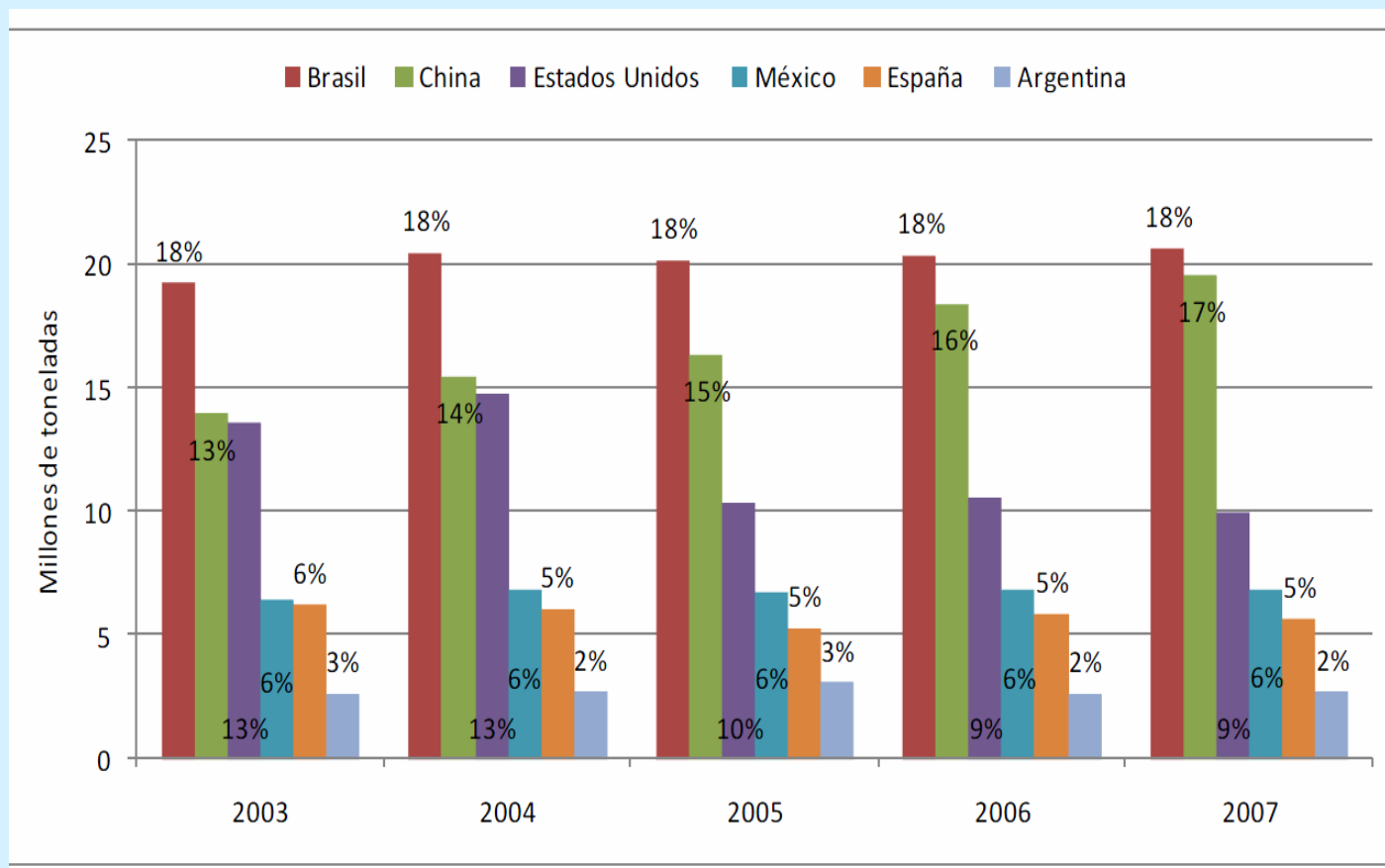
Content

- Citrus fruit production and trade
- UNECE & Codex Citrus fruit standards
- UNECE Citrus fruit standard
 - Definition of produce
 - Minimum requirements
 - Maturity requirements
 - Classification
 - Sizing
 - Tolerances
 - Presentation
 - Marking
- Conclusions



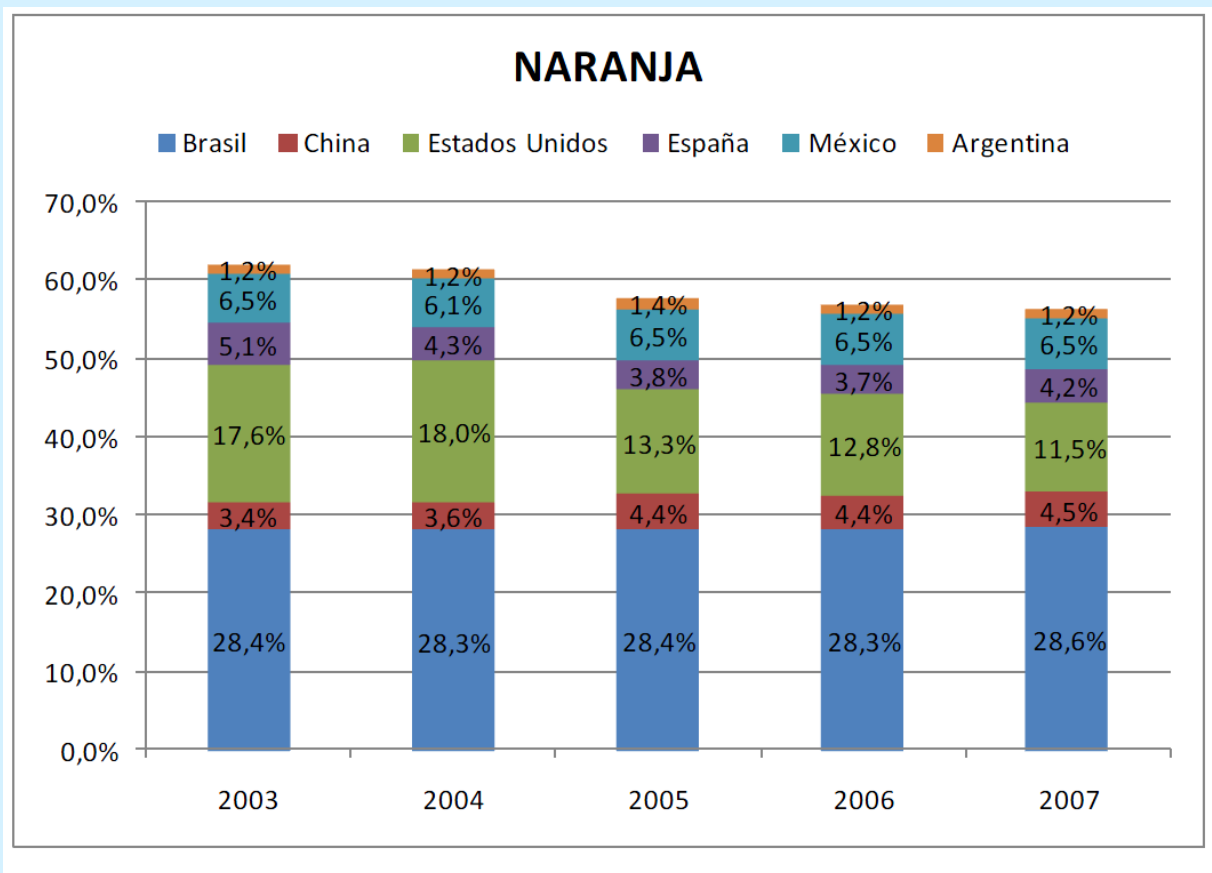
Citrus fruit production and trade

- Top world citrus fruit producers



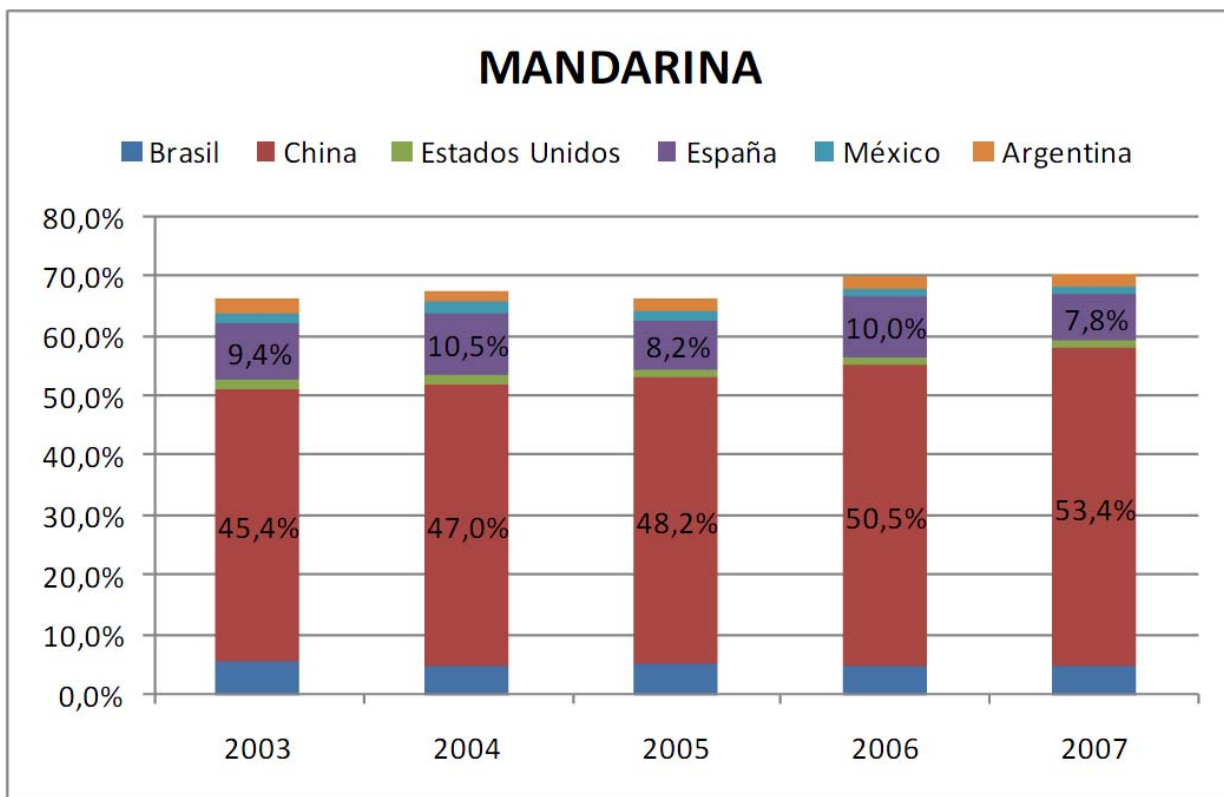
Citrus fruit production and trade

- Top world citrus fruit producers. Oranges.



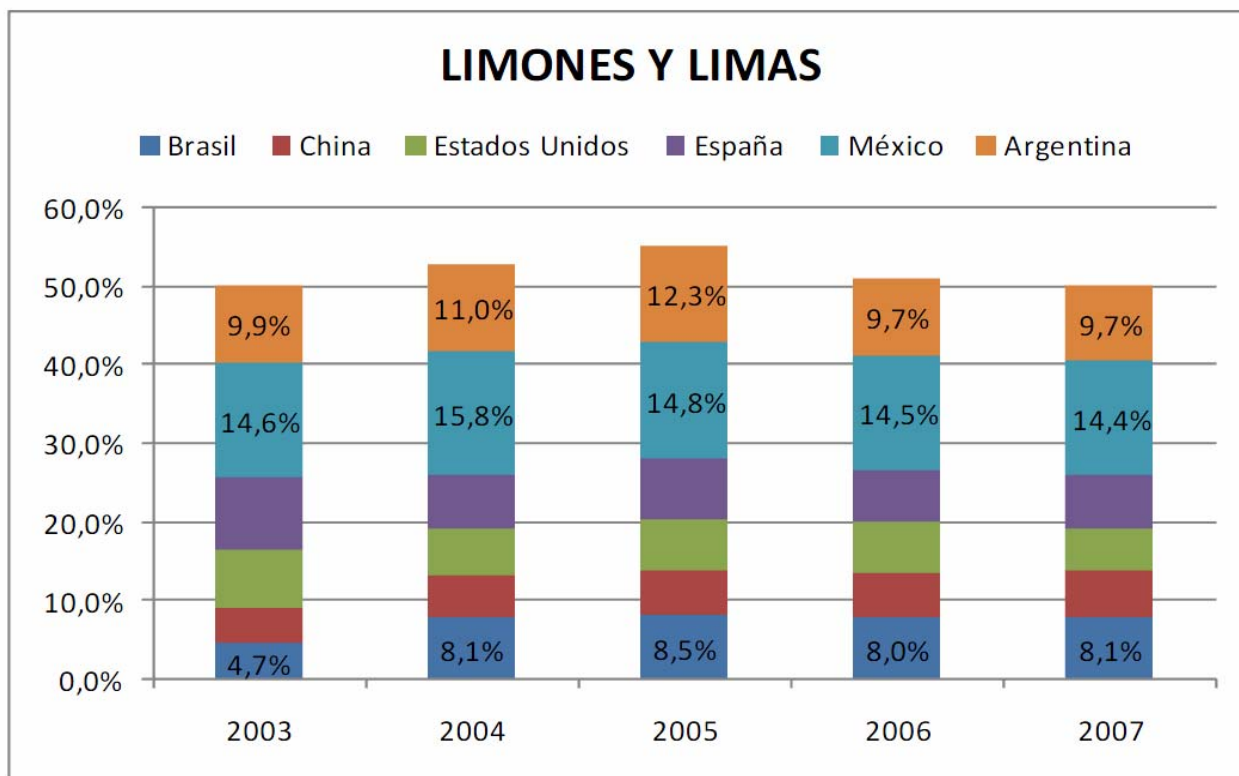
Citrus fruit production and trade

- Top world citrus fruit producers. Mandarins.



Citrus fruit production and trade

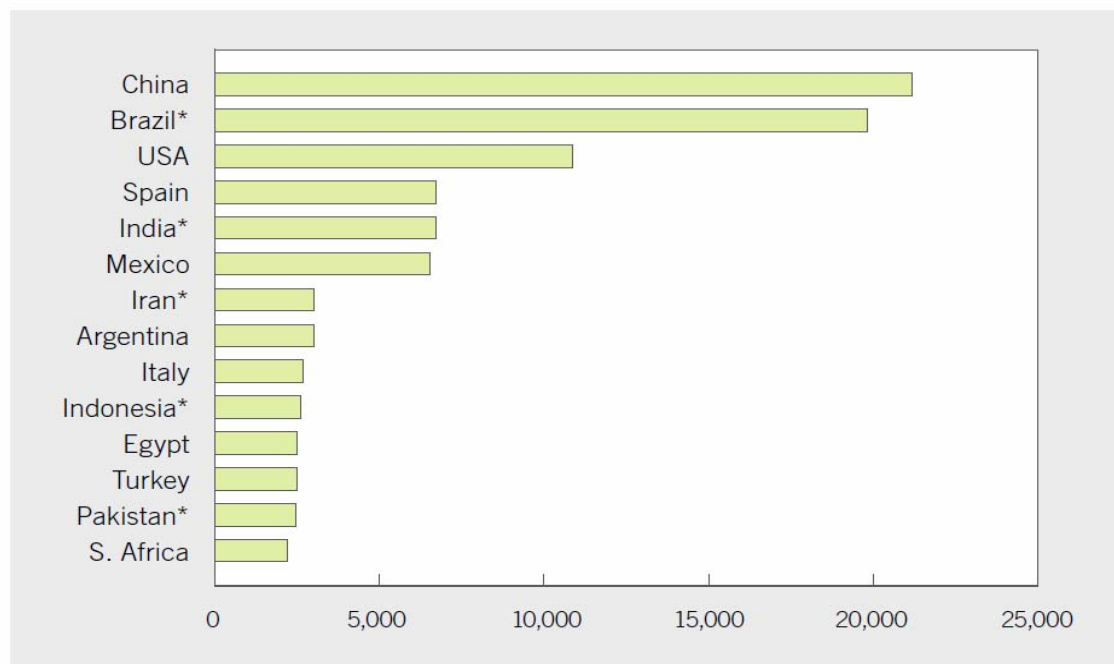
- Top world citrus fruit producers. Lemons and limes.



Citrus fruit production and trade

- World citrus production

WORLD FRESH CITRUS PRODUCTION 2008/09 (thousand tons)



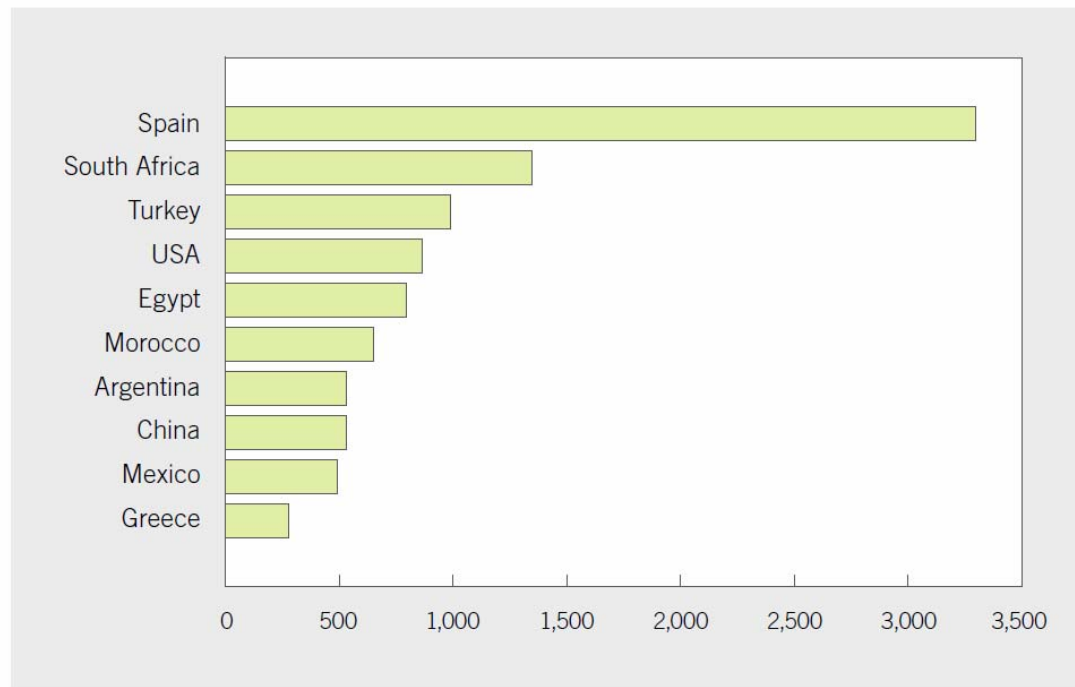
SOURCE: FAO, CLAM



Citrus fruit production and trade

- World citrus exporters

WORLD FRESH CITRUS EXPORTS 2008/09 (thousand tons)



SOURCE: FAO, CLAM, SHAFTE



Citrus Fruit production in Spain

Citrus fruit production in Spain (Tons)

| | <i>2007/08</i> | <i>2008/09</i> | <i>2009/10</i> | <i>2010/11</i> |
|--------------------|------------------|------------------|------------------|------------------|
| <i>Oranges</i> | 2.705.000 | 3.462.571 | 2.756.042 | 2.996.093 |
| <i>Mandarins</i> | 2.040.000 | 2.229.626 | 2.021.023 | 2.127.531 |
| <i>Lemons</i> | 552.192 | 945.562 | 673.075 | 807.000 |
| <i>Grapefruits</i> | 46.194 | 50.814 | 52.000 | 55.000 |
| Total | 5.343.386 | 6.688.573 | 5.502.140 | 5.985.624 |

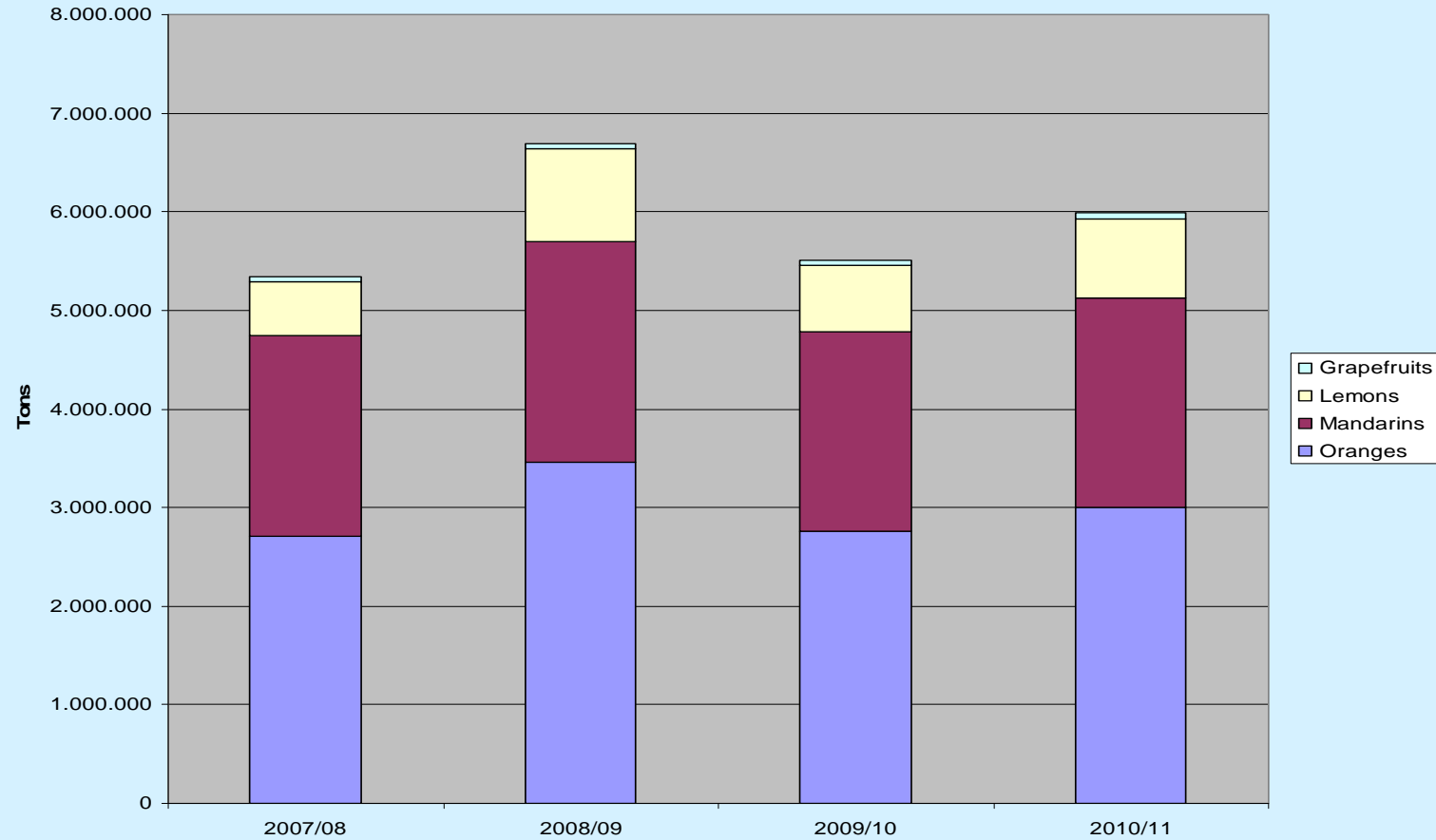
Source: SHAFTE, AILIMPO, FRESHFEL



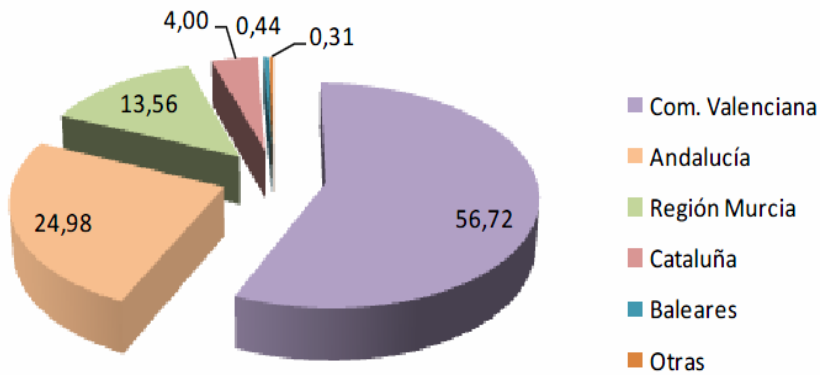
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Citrus Fruit production in Spain

Citrus fruit production in Spain



Citrus Fruit production in Spain

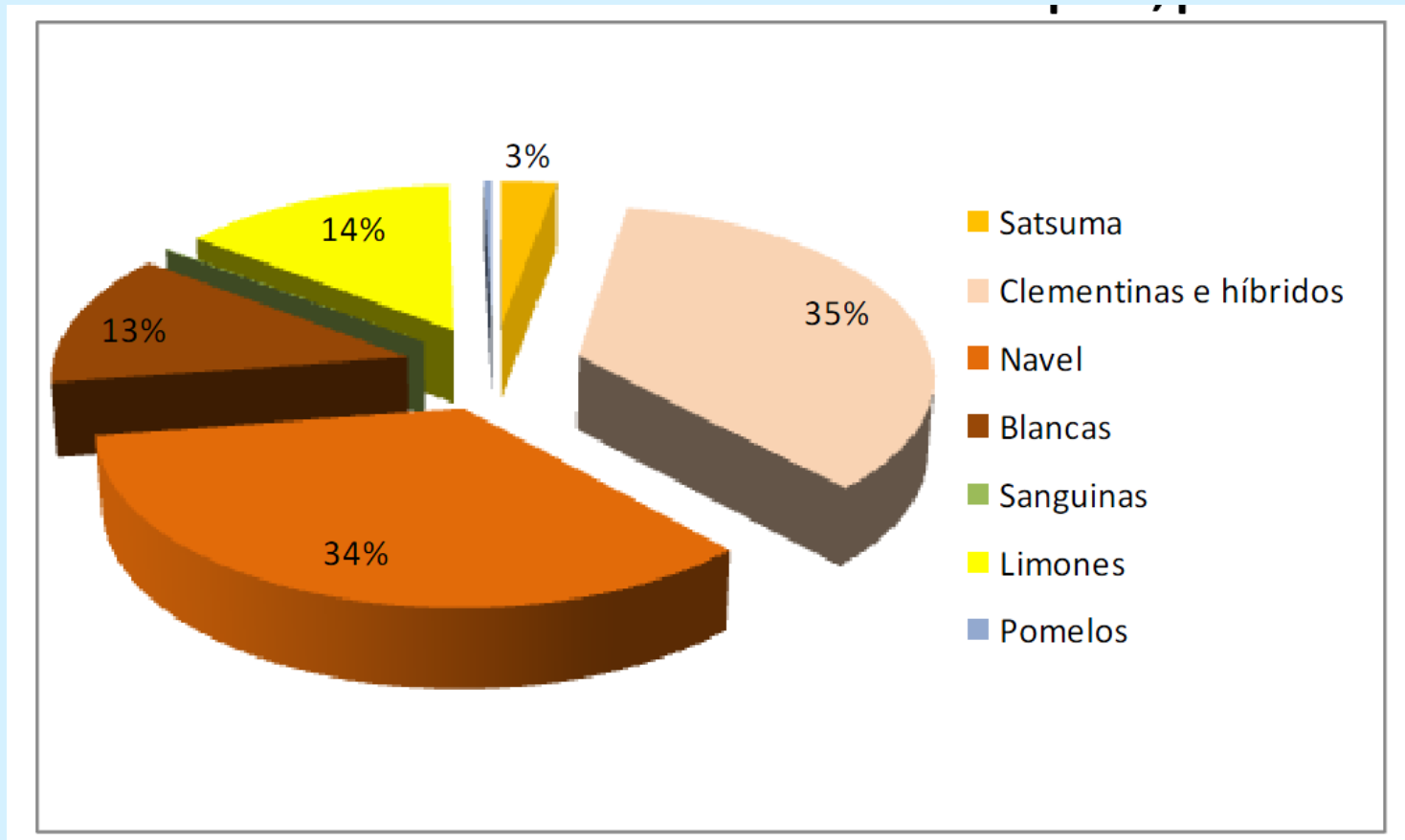


- Citrus Fruit production in Spain. Production areas.



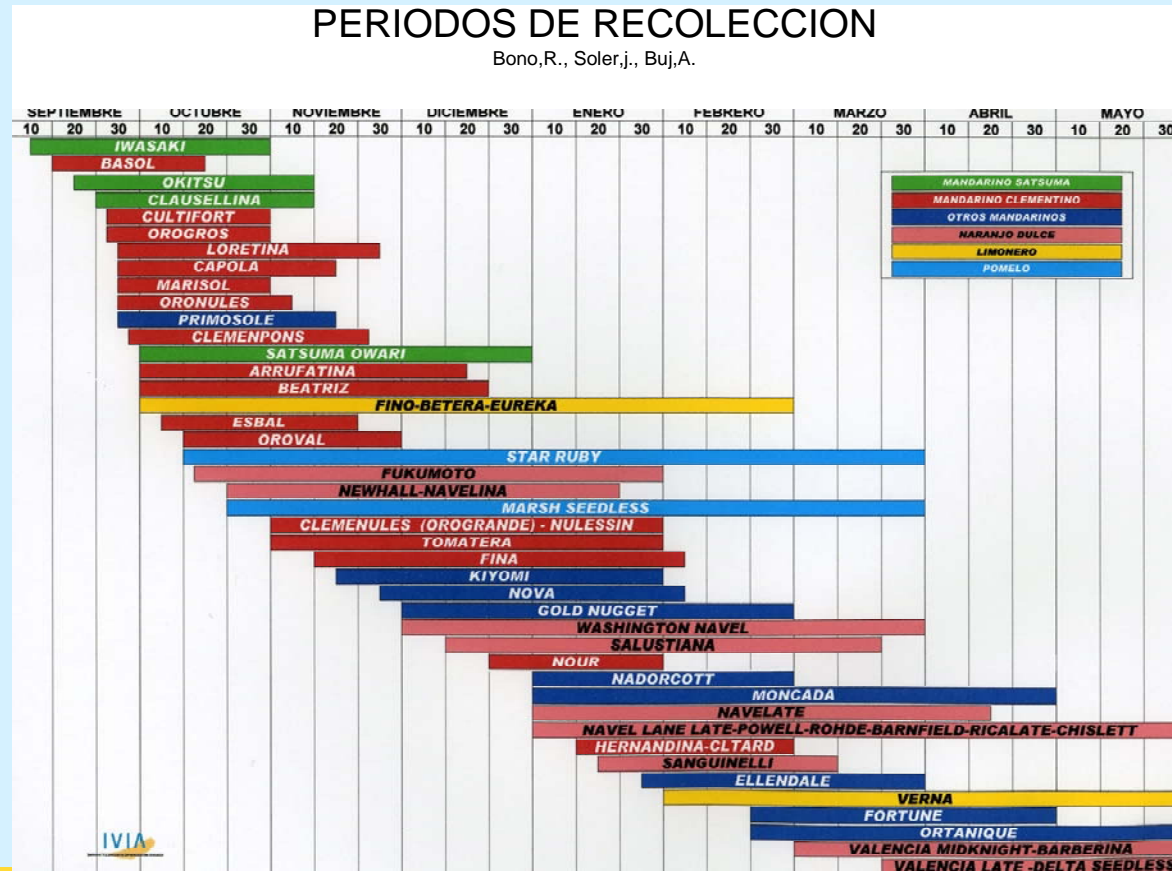
Citrus Fruit production in Spain

- Citrus Fruit production in Spain. Varietal distribution.



Citrus Fruit production in Spain

- Varieties calendar



Citrus Fruit – Codex/UNECE Stds

Citrus Fruit – UNECE Standard FFV-14

- lemons
- Persian limes
- Mexican limes
- Indian sweet limes
- mandarins
- oranges
- grapefruits
- pummelos.

Codex Standards for:

- Oranges (Codex Stan 245-2004)
- Grapefruits (Codex Stan 219-1999)
- Mexican limes (Codex Stan 217-1999)
- Pummelos (Codex Stan 214-1999)
- Limes (Codex Stan 213-1999)



Citrus Fruit – Codex/UNECE Stds

UNECE Standard

- Definition of produce
- Provisions concerning quality
- Provisions concerning sizing
- Provisions concerning tolerances
- Provisions concerning presentation
- Provisions concerning marking

CODEX Standards

- DEFINITION OF PRODUCE
- PROVISIONS CONCERNING QUALITY
- PROVISIONS CONCERNING SIZING
- PROVISIONS CONCERNING TOLERANCES
- PROVISIONS CONCERNING PRESENTATION
- MARKING OR LABELLING
- **CONTAMINANTS**
- **HYGIENE**



Citrus Fruit – UNECE Std FFV-14

Concerning the
marketing and
commercial
quality control of
citrus fruit



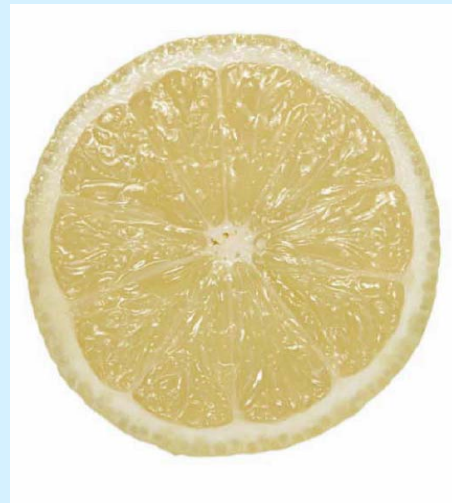
I. Definition of Produce

This standard applies to the following varieties (cultivars) of fruit, classified as “citrus fruit”, to be supplied **fresh** to the consumer, **citrus fruit for industrial processing being excluded**:



I. Definition of Produce

- **lemons** grown from the species *Citrus limon* (L.) Burm. f.

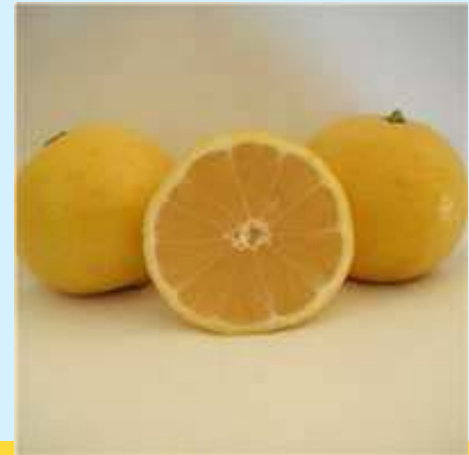


Eureka



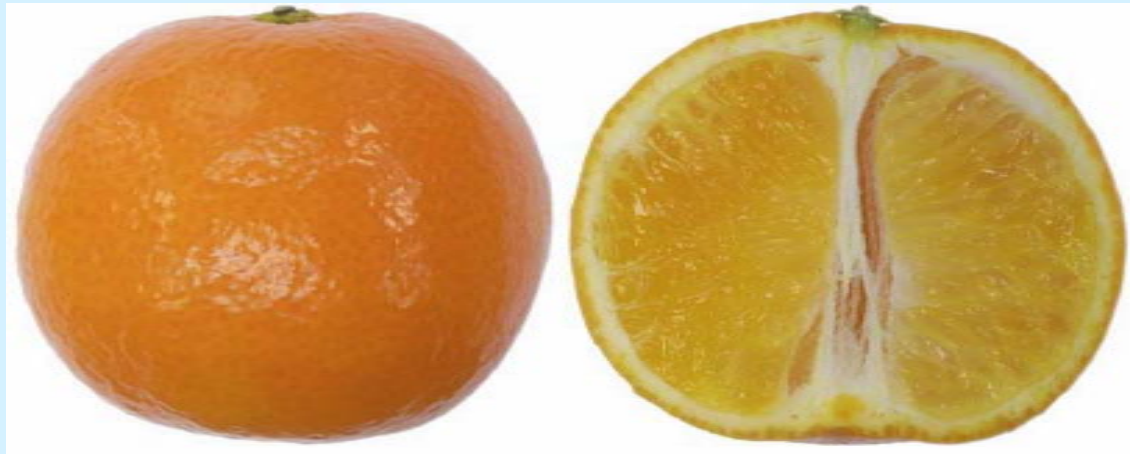
I. Definition of Produce

- **Persian limes**, *Citrus latifolia* (Yu. Tanaka) Tanaka, a large fruited acid lime known also as Bearss or Tahiti and hybrids thereof
- **Mexican limes**, *Citrus aurantifolia* (Christm.) Swingle, also known as key limes and sour limes and hybrids thereof
- **Indian sweet limes**, *Citrus limettioides* Tanaka, or Palestine sweet limes.



I. Definition of Produce

- **Mandarins** (*Citrus reticulata* Blanco), including satsumas (*Citrus unshiu* Marcow.), clementines (*Citrus clementina* hort. ex Tanaka), common mandarins (*Citrus deliciosa* Ten.) and tangerines (*Citrus tangerina* Tanaka) grown from these species and hybrids thereof.

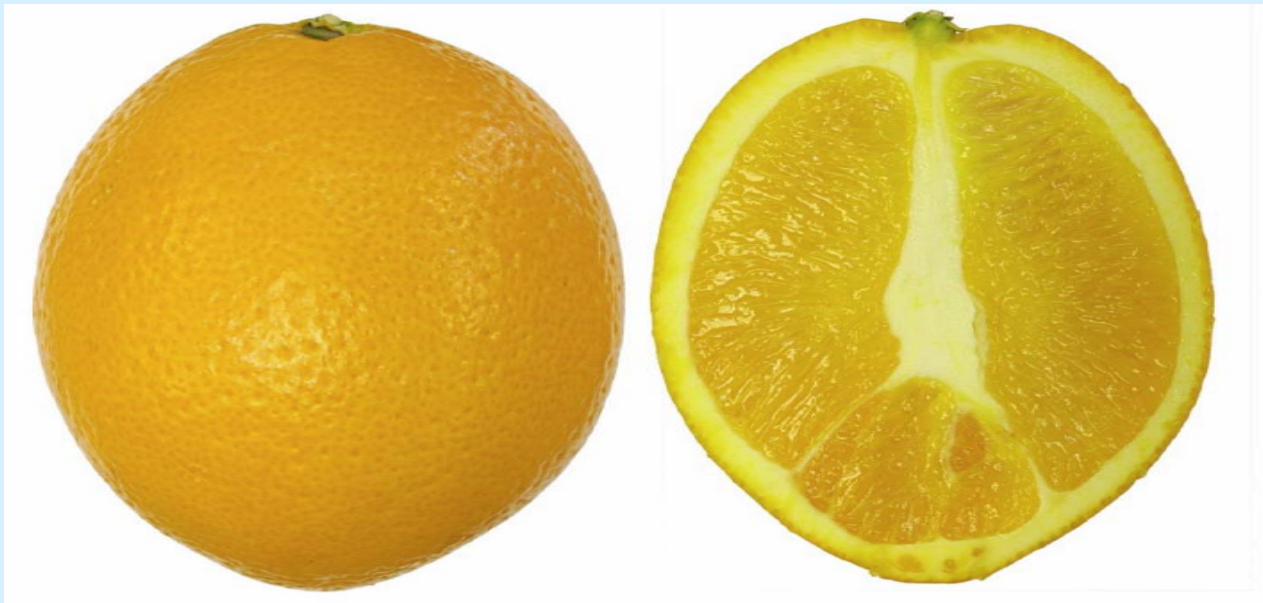


Clementine (Clemenules)



I. Definition of Produce

- **Oranges**, grown from the species *Citrus sinensis* (L.) Osbeck



Navel group (Navel Late)



I. Definition of Produce

- **Grapefruit** grown from the species *Citrus paradisi* Macfad. and hybrids thereof.
- **Pummelos or Shaddock** grown from the species *Citrus maxima* (Burm.) Merr. and hybrids thereof.



Grapefruit (Star Ruby)



Pummelo (Chandler)



II. Provisions concerning quality

The purpose of the standard is to define the quality requirements for citrus fruit at the export-control stage after preparation and packaging.

However, if applied at stages following export, products may show in relation to the requirements of the standard:

- a slight lack of freshness and turgidity
- in classes I and II, a slight deterioration due to their development and their tendency to perish.



II. Provisions concerning quality

The holder/seller of products may not display such products or offer them for sale, or deliver or market them in any manner other than in conformity with this standard. The holder/seller shall be responsible for observing such conformity.

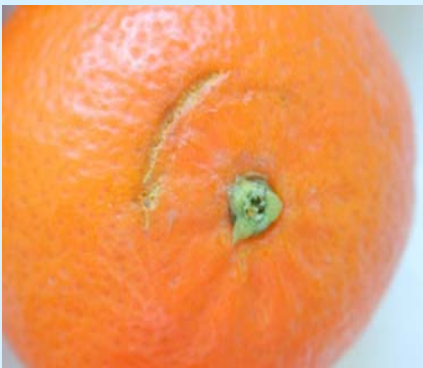


A. Minimum requirements

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



- intact (Codex: “whole”)



- free of bruising and/or extensive healed overcuts



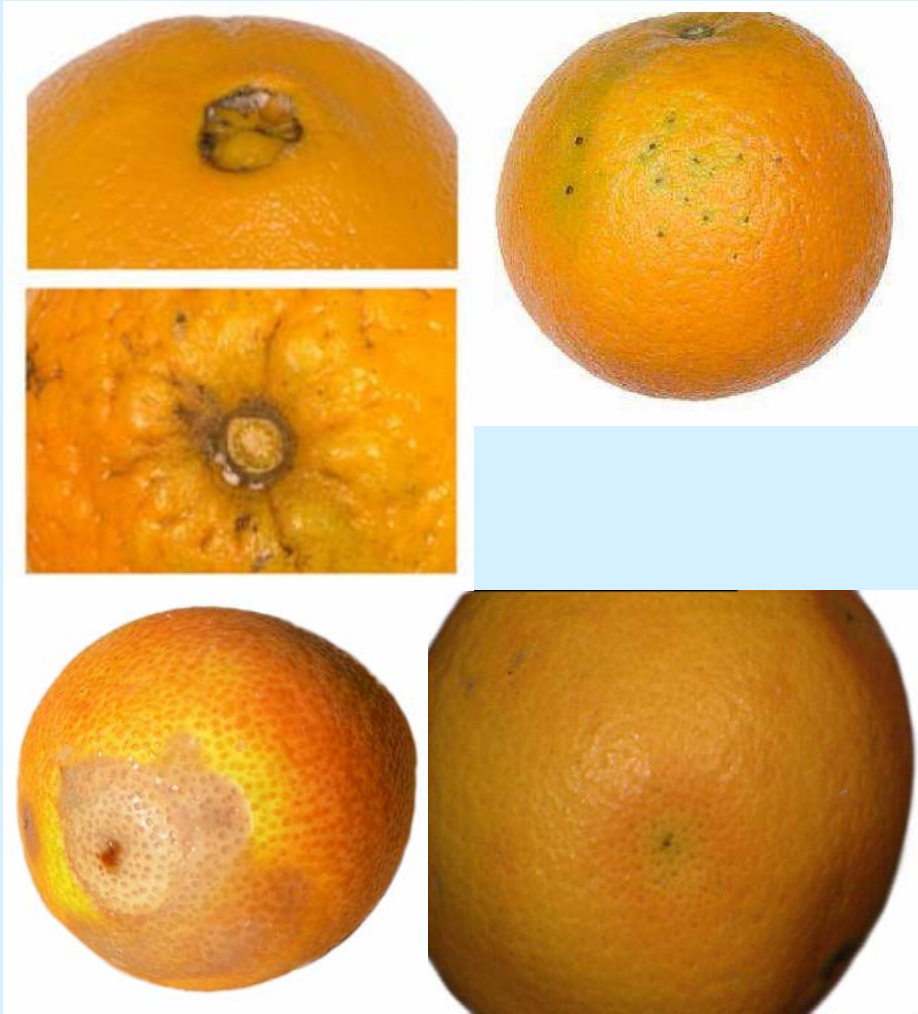
A. Minimum requirements



- sound; produce affected by rotting or deterioration such as to make it unfit for consumption is excluded
- clean, practically free of any visible foreign matter



A. Minimum requirements



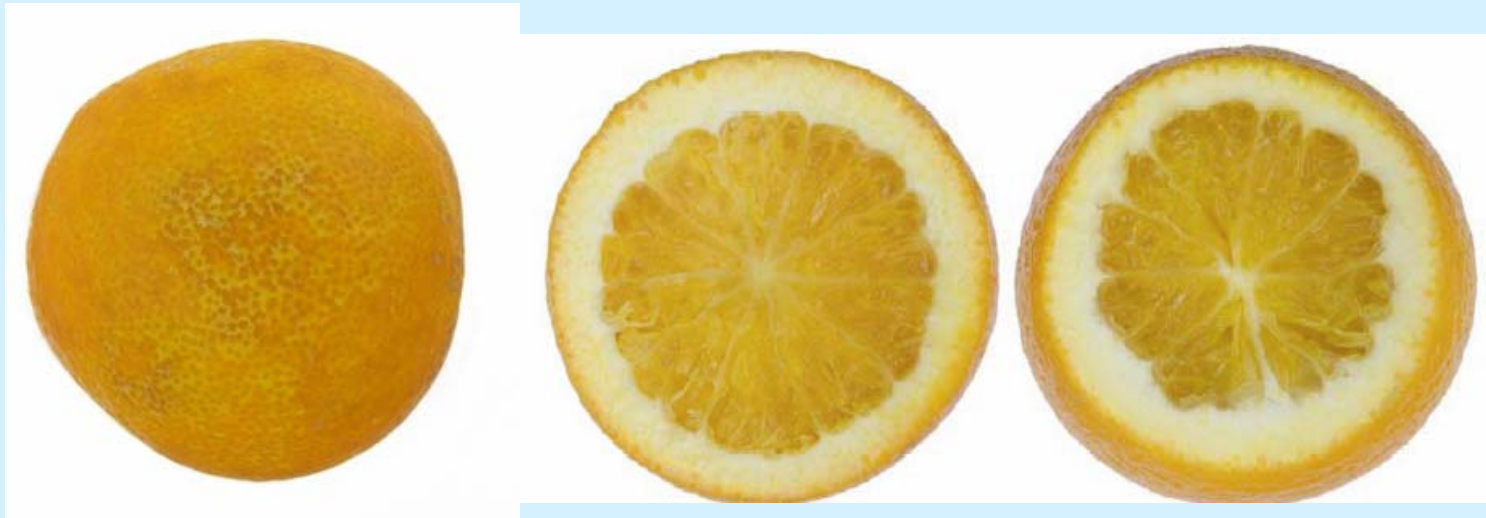
- practically free from pests

- free from damage caused by pests affecting the flesh



A. Minimum requirements

- free of signs of shrivelling and dehydration
- free of damage caused by low temperature or frost



A. Minimum requirements

- free of abnormal external moisture
- free of any foreign smell and/or taste.

The development and condition of the citrus fruit must be such as to enable it:

- to withstand transportation and handling
- to arrive in satisfactory condition at the place of destination.



B. Maturity requirements

The citrus fruit must have reached an appropriate degree of development and ripeness, proper to the variety, the time of picking and the growing area.

Maturity of citrus fruit is defined by the following parameters specified for each species below:

1. minimum juice content
2. minimum soluble solids content
3. minimum sugar/acid ratio
4. Colouring

A reference method for calculating the juice content and the sugar/acid ratio is described in the Guidelines on Objective Test to Determine Quality of Fruit and Vegetables and Dry and Dried Produce (<http://www.oecd.org/tad/fv>).



B. Maturity requirements

| | <i>Minimum juice content (per cent)</i> | <i>Minimum sugar content (°Brix)</i> | <i>Minimum sugar/acid ratio</i> | <i>Colouring</i> |
|--|---|--------------------------------------|---------------------------------|--|
| Lemons | | | | |
| Lemons | 20 | | | Typical of the variety. Green colour is allowed. |
| Limes | | | | |
| Persian lime | 42 | | | Yellow patches up to 30% of its surface |
| Mexican and Indian limes | 40 | | | Yellow patches up to 20% of its surface |
| Satsumas, clementines, other mandarin varieties and their hybrids | | | | |
| Satsumas | 33 | | 6.5:1 | Typical of the variety on at least 1/3 of the surface of the fruit |
| Clementines | 40 | | 7.0:1 | |
| Other mandarins and hybrids | 33 | | 7.5:1 | |
| Oranges | | | | |
| Blood oranges | 30 | | 6.5:1 | Typical of the variety. Fruit with light green colour < 1/5 of the total surface area is allowed. |
| Navels group | 33 | | 6.5:1 | |
| Other varieties | 35 | | 6.5:1 | |
| Mosambi, Sathgudi and Pacitan with more than one fifth green colour | 33 | | | |
| Other varieties with more than one fifth green colour | 45 | | | Oranges produced in areas with high temps and high humidity may have a green colour on > 1/5 of the surface. |
| Grapefruit and hybrids | | | | |
| All varieties and hybrids | 35 | | | Typical of the variety. Fruit with a greenish colour (green in Oroblanco) is allowed. |
| Oroblanco | 35 | 9 | | |
| Pummelos (Shaddock) and hybrids | | 8 | | Typical of the variety on at least 2/3 of the fruit |



B. Maturity requirements

Colour

The degree of colouring shall be such that following normal development the citrus fruit reaches the colour typical of the variety at their destination point.

Lemons. Fruit with a green (but not dark green) colour are allowed, provided they satisfy the minimum requirements as to juice content



Limes. The fruit should be green but may show yellow patches up to 30% of its surface for Persian limes and up to 20% for Mexican and Indian limes



B. Maturity requirements

Colour

Mandarins. Must be typical of the variety on at least one third of the surface of the fruit

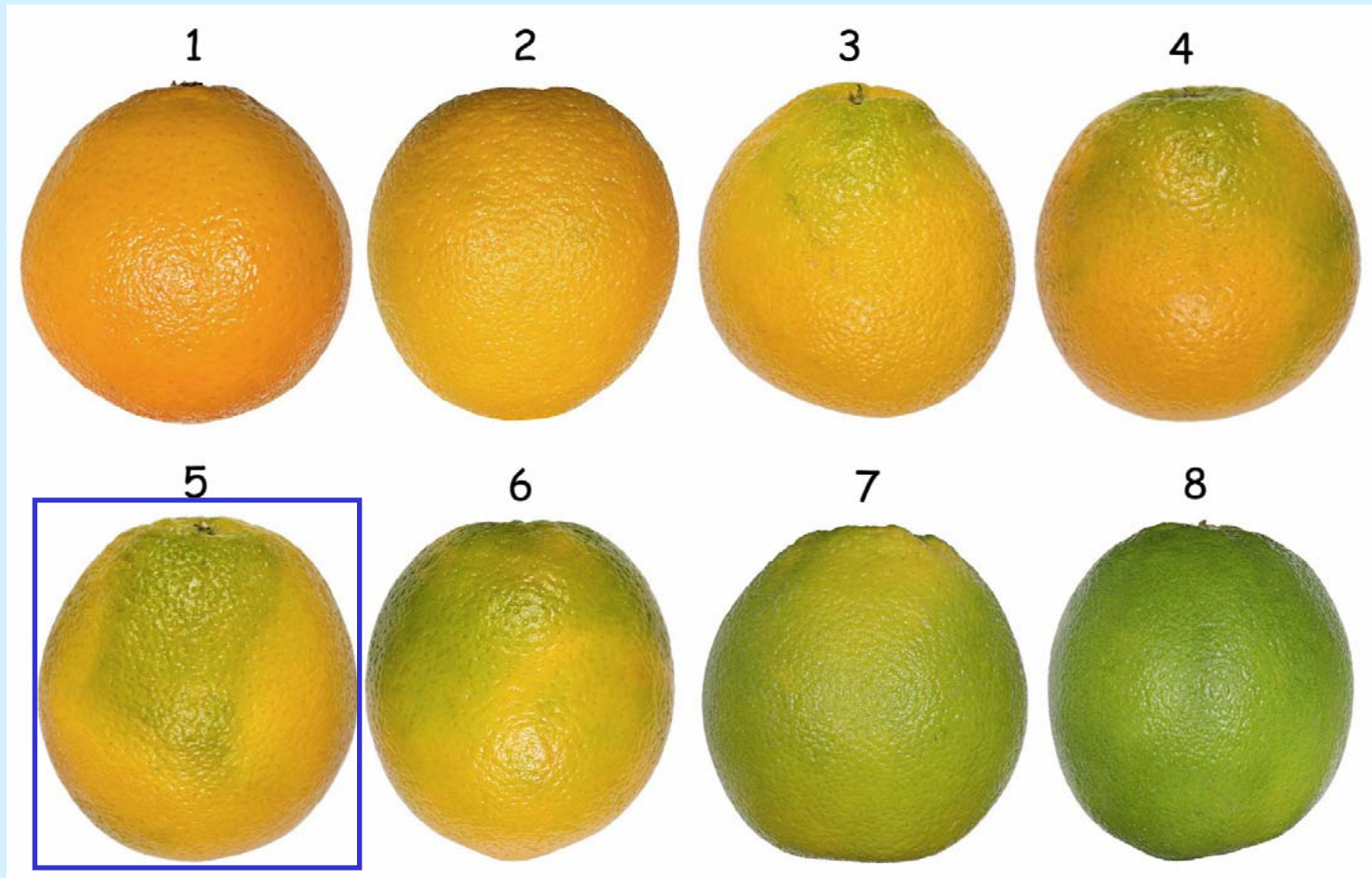


Oranges. Fruit with light green colour not exceeding 1/5 of the fruit are allowed, provided they satisfy the minimum requirements as to juice content.

Oranges produced in areas with high temperatures and high humidity conditions may have a green colour exceeding 1/5 of the fruit, provided they satisfy the minimum requirements as to juice content.



B. Maturity requirements



B. Maturity requirements

Grapefruits. Fruit with a greenish colour (green in Oroblanco) are allowed, provided they satisfy the minimum requirements as to juice content.



Star Ruby

Oroblanco

Pummelos. Must be typical of the variety on at least 2/3 of the fruit



B. Maturity requirements



Degreening damages

Degreening

- Citrus fruit meeting these maturity requirements may be “degreened”. This treatment is only permitted if the other natural organoleptic characteristics are not modified.



C. Classification

Citrus fruit is classified in three classes:

- **Extra Class**
- **Class I**
- **Class II**

Out of grade = not satisfying the minimum requirements.



C. Classification



Extra Class

- Superior quality and characteristic of the variety and/or commercial type.
- Free from defects, with the exception of very slight superficial defects.



C. Classification



Class I

Defects allowed:

- a slight defect in shape
- slight defects in colouring, including slight sunburn



C. Classification



Class I

Defects allowed:

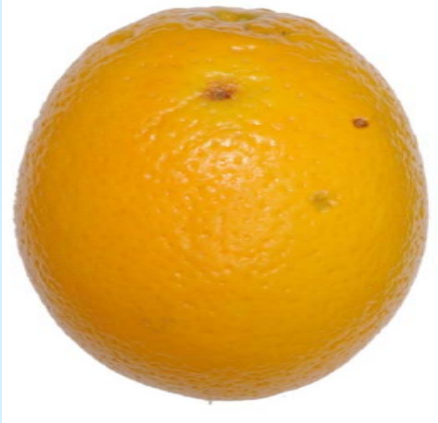
- slight progressive skin defects, provided they do not affect the flesh
- slight skin defects occurring during the formation of the fruit, such as silver scurfs, russets or pest damage



C. Classification

Class I

Defects allowed:



- slight healed defects due to a mechanical cause such as hail damage, rubbing or damage from handling



- slight and partial detachment of the peel (or rind) for all fruit of the mandarin group.



C. Classification



Class II

Defects allowed:

- defects in shape
- defects in colouring, including sunburn



C. Classification



Class II

Defects allowed:

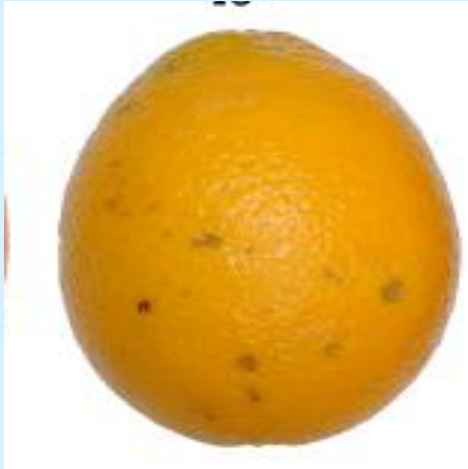
- progressive skin defects, provided they do not affect the flesh
- skin defects occurring during the formation of the fruit, such as silver scurfs, russets or pest damage

C. Classification

Class II

Defects allowed:

- healed defects due to a mechanical cause such as **hail damage**, rubbing or damage from handling
- superficial healed skin alterations

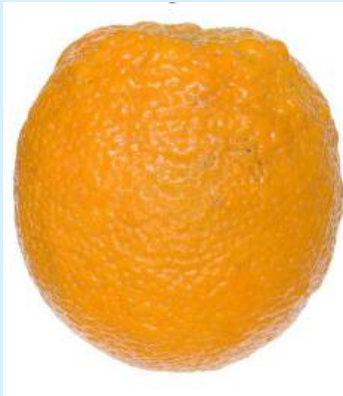


C. Classification

Class II

Defects allowed:

- rough skin
- a slight and partial detachment of the peel (or rind) for oranges and a partial detachment of the peel (or rind) for fruit of the mandarin group.



Grading

International Standards for Fruit and Vegetables: Citrus Fruits Normes internationales des fruits et légumes : agrumes

Internal Navels / Ombilics internes

1 2 3 4

5 6 7 8

Limit allowed
Extra Class
Limite admise
Cat. «Extra»

Limit allowed
Class I
Limite admise
Cat. I

Limit allowed
Class II
Limite admise
Cat. II

| Oranges | Extra Class Cat. «Extra» | Class I Cat. I | Class II Cat. II | Out of Grade Non conforme | Notes |
|--------------------------------------|-----------------------------|-------------------|---------------------|------------------------------|-------|
| Internal Navels Ombilics internes | 1, 2, 3 | 4, 5, 6 | 7 | 8 | |

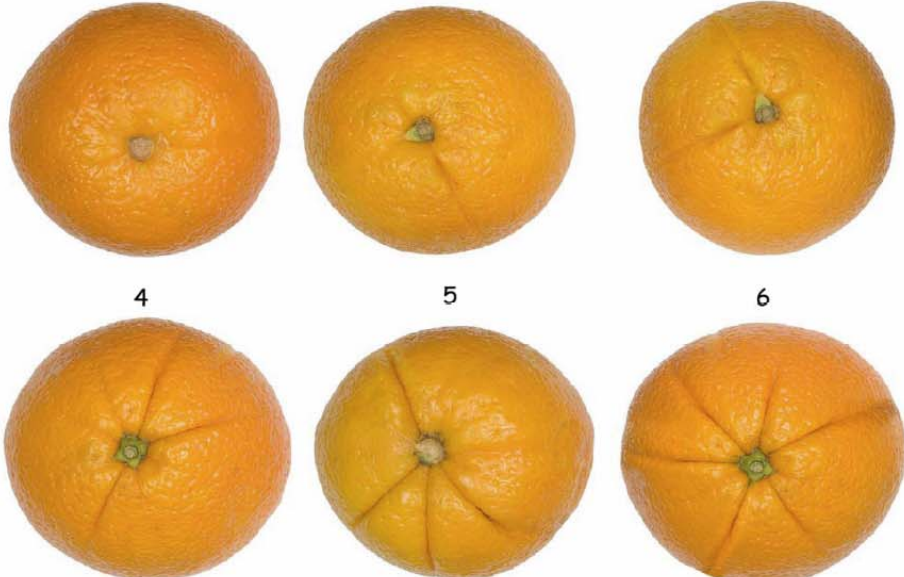
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Grading

International Standards for Fruit and Vegetables: Citrus Fruits

Normes internationales des fruits et légumes : agrumes

Ribbed Navels / Ombilics à côtes



1 2 3

4 5 6

| Oranges | Extra Class Cat. «Extra» | Class I Cat. I | Class II Cat. II | Out of Grade Non conforme | Notes |
|-----------------------------------|-----------------------------|-------------------|---------------------|------------------------------|---|
| Ribbed Navels Ombilics à côtes | 1, 2, 3, 4, 5, 6 | | | | Uniformity: only 3 adjacent fruit allowed within the same consignment. Homogénéité : limitation à 3 fruits adjacents dans un même colis. |

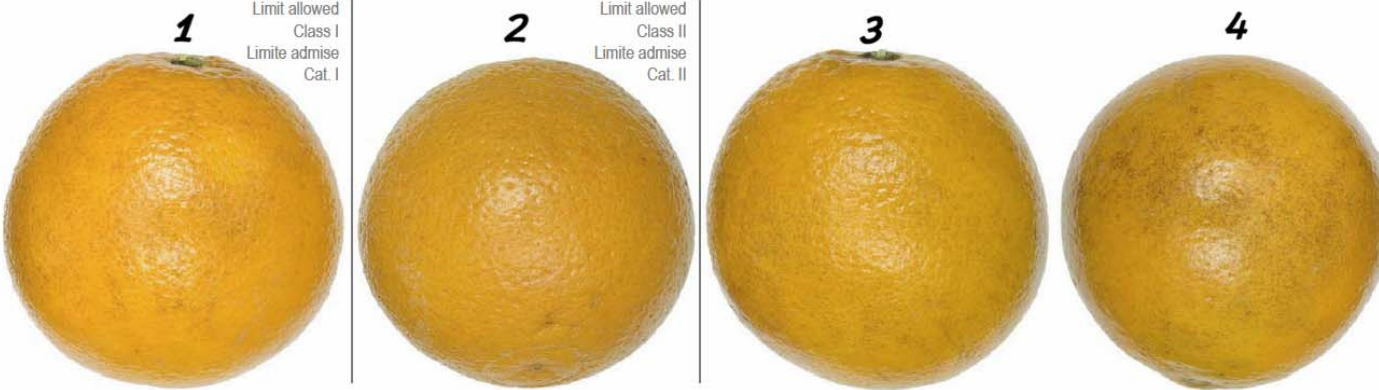
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Grading

International Standards for Fruit and Vegetables: Citrus Fruits / Normes internationales des fruits et légumes : agrumes

Rust mite damage / Attaques de phytopte



1 Limit allowed Class I / Limite admise Cat. I

2 Limit allowed Class II / Limite admise Cat. II

3

4

| Oranges | Extra Class Cat. «Extra» | Class I Cat. I | Class II Cat. II | Out of Grade Non conforme | Notes |
|--|-----------------------------|-------------------|---------------------|------------------------------|--|
| Rust mite damage Attaques de phytopte | x | 1 | 2 | 3, 4 | This illustration used for both Oranges and Easy Peelers. Illustration utilisée pour les oranges et les petits agrumes. |

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Grading

International Standards for Fruit and Vegetables: Citrus Fruits
Normes internationales des fruits et légumes : agrumes

Superficial Dark Coloured Silver Scurfs
Incrustations argentées superficielles de teinte foncée

| Oranges | Extra Class Cat. «Extra» | Class I Cat. I | Class II Cat. II | Out of Grade Non conforme | Notes |
|--|-----------------------------|-------------------|---------------------|------------------------------|--|
| Superficial Dark Coloured Silver Scurfs Incrustations argentées superficielles de teinte foncée | 1, 2 | 3, 4, 5 | 6, 7 | 8 | Can also be caused by pests. Peuvent aussi avoir une origine parasitaire. |

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III. Provisions concerning sizing

Size is determined by the maximum diameter of the equatorial section of the fruit or by count.

A. Minimum size. Table of minimum sizes.

B. Uniformity. Options of sizing (3):

a) Ranges in size (4)

b) Sizing table (size codes)

c) For fruit sized by count, the difference in size should be consistent with (a)

Substantial differences with Codex standards, where there are two options: sizing tables and by count.



III. Provisions concerning sizing

Size is determined by the maximum diameter of the equatorial section of the fruit or by count.

A. Minimum size. The following minimum sizes apply:

| Fruit | Diameter (mm) |
|--|----------------------|
| Lemons | 45 |
| Persian limes | 42 |
| Mexican and Indian limes | 25 |
| Satsumas, other mandarin varieties and hybrids | 45 |
| Clementines | 35 |
| Oranges | 53 |
| Grapefruit and hybrids | 70 |
| Pummelos and hybrids | 100 |



III. Provisions concerning sizing

B. Uniformity. Option (a)

To ensure uniformity in size, the range in size between produce in the same package shall not exceed:

- **10 mm**, if the **diameter** of the smallest fruit (as indicated on the package) is **< 60 mm**
- **15 mm**, if the **diameter** of the smallest fruit (as indicated on the package) is **≥ 60 mm but < 80 mm**
- **20 mm**, if the diameter of the smallest fruit (as indicated on the package) is **≥ 80 mm but < 110 mm**
- there is **no limitation** of difference in diameter for fruit **≥ 110 mm**



III. Provisions concerning sizing

B. Uniformity. Option (b) Size codes.

When size codes are applied, the codes and ranges in the following tables must be respected:

| Oranges | |
|------------------|----------------------|
| <i>Size code</i> | <i>Diameter (mm)</i> |
| 0 | 92 - 110 |
| 1 | 87 - 100 |
| 2 | 84 - 96 |
| 3 | 81 - 92 |
| 4 | 77 - 88 |
| 5 | 73 - 84 |
| 6 | 70 - 80 |
| 7 | 67 - 76 |
| 8 | 64 - 73 |
| 9 | 62 - 70 |
| 10 | 60 - 68 |
| 11 | 58 - 66 |
| 12 | 56 - 63 |
| 13 | 53 - 60 |

| Grapefruit and hybrids | |
|-------------------------------|----------------------|
| <i>Size code</i> | <i>Diameter (mm)</i> |
| 0 | >139 |
| 1 | 109 - 139 |
| 2 | 100 - 119 |
| 3 | 93 - 110 |
| 4 | 88 - 102 |
| 5 | 84 - 97 |
| 6 | 81 - 93 |
| 7 | 77 - 89 |
| 8 | 73 - 85 |
| 9 | 70 - 80 |



III. Provisions concerning sizing

| Oranges | |
|-----------|---------------|
| Size code | Diameter (mm) |
| 0 | 92 - 110 |
| 1 | 87 - 100 |
| 2 | 84 - 96 |
| 3 | 81 - 92 |
| 4 | 77 - 88 |
| 5 | 73 - 84 |
| 6 | 70 - 80 |
| 7 | 67 - 76 |
| 8 | 64 - 73 |
| 9 | 62 - 70 |
| 10 | 60 - 68 |
| 11 | 58 - 66 |
| 12 | 56 - 63 |
| 13 | 53 - 60 |

B. Uniformity. Option (b) Size codes.

Uniformity in size is achieved by the above-mentioned size scales, unless otherwise stated as follows:

For fruit in bulk bins and fruit in sales packages of a maximum net weight of 5 kg, the maximum difference must not exceed the range obtained by grouping three consecutive sizes in the size scale.



IV. Provisions concerning tolerances

- At all marketing stages, tolerances in respect of quality and size shall be allowed in each lot for produce not satisfying the requirements of the class indicated.
 - A. Quality tolerances
 - B. Size tolerances

IV. Provisions concerning tolerances

A. Quality tolerances

- (i) "Extra" Class

5 % of fruit not satisfying the requirements of the class but meeting those of Class II, including not more than **0.5 %** of Class II produce.

- (ii) Class I

10 % of fruit not satisfying the requirements of the class but meeting those of Class II, including not more than **1 %** of produce meeting neither the requirements of Class II nor the minimum requirements, or of produce affected by **decay**.

- (iii) Class II

10 % of fruit meeting neither the requirements of the class nor the minimum requirements, including not more than **2 %** of produce affected by **decay**.

Differences with Codex standards, where the decay is not tolerated.

IV. Provisions concerning tolerances

A. Size tolerances

- 10 % of fruit corresponding to the size immediately below and/or above that (or those, in the case of the combination of three sizes) mentioned on the package is allowed.
- This tolerance of 10 % does not apply below this minima:

| <i>Fruit</i> | <i>Diameter (mm)</i> |
|--|----------------------|
| Lemons | 43 |
| Persian limes | 40 |
| Mexican and Indian limes | Not applicable |
| Satsumas, other mandarin varieties and hybrids | 43 |
| Clementines | 34 |
| Oranges | 50 |
| Grapefruit and hybrids | 67 |
| Pummelos and hybrids | 98 |



V. Provisions concerning presentation



Non uniform colour

A. Uniformity

- The contents of each package must be uniform and contain only citrus fruit of the same origin, variety or commercial type, quality and size, and appreciably of the same degree of ripeness and development.
- In addition, for "Extra" Class, uniformity in colouring is required.



V. Provisions concerning presentation

A. Uniformity

- However, a **mixture of citrus fruit of distinctly different species** may be packed together in a sales package, provided they are uniform in quality and, for each species concerned, in variety or commercial type and origin.
- The visible part of the contents of the package must be representative of the entire contents.

Differences with Codex standards, where the mixture of citrus fruit is not possible.

V. Provisions concerning presentation



- **B. Packaging**
- Must protect the produce properly.
- Materials used inside the package must be clean and avoid causing any external or internal damage to the produce. Non toxic ink or glue used.
- Stickers are allowed but, when removed, they shall neither leave traces of glue, nor lead to skin defects.
- Free of all foreign matter. **However, a presentation where a short twig with some green leaves** adheres to the fruit is allowed.
- The short twig presentation is not contemplated in Codex std.



V. Provisions concerning presentation



Codex Std has a point

5.3 PRESENTATION

Oranges

Fruit may be presented:

- arranged in layers in packages
- not arranged in layers in packages; only Classes I and II
- direct sales packages weighing less than 5kg



VI. Provisions concerning marking

- Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside:



- A. Identification
- B. Nature of produce
- C. Origin of produce
- D. Commercial specifications**
- E. Official control mark (optional)

Differences in B (mixtures), C (more detail) and D (post harvest treatment) with Codex standards.



VI. Provisions concerning marking

A. Identification

- Packer and/or dispatcher/shipper:
- Name and physical address (e.g. street/city/region /postal code and, if different from the country of origin, the country) or a code mark officially recognized by the national authority.

VI. Provisions concerning marking

B. Nature of produce

- Common name of the species if not visible from the outside
- “Mixture of citrus fruit” or equivalent
- Name of the variety, **for oranges**
- **For the mandarins group:**
 - Satsumas: “Satsumas”, variety may be included
 - Clementines: “Clementines”, variety may be included and, where appropriate:
 - For fruit with no seeds, “seedless”
 - For fruit with 1 to 10 seeds, only “Clementines”
 - For fruit with more than 10 seeds, “with seeds”
 - Other mandarins and their hybrids: name of the variety
- For grapefruit, pummelos and hybrids: “pink” or “red”
- “Seedless” (optional).



VI. Provisions concerning marking

C. Origin of produce

- Country of origin⁸ and, optionally, district where grown, or national, regional or local place name
- In the case of a mixture of citrus fruit of distinctly different species of different origins, the indication of each country of origin shall appear next to the name of the species concerned.



VI. Provisions concerning marking

D. Commercial specifications

- Class
- Size expressed as:
 - Minimum and maximum size (in mm) or
 - Size code(s) followed, optionally, by a minimum and maximum size or
 - Count
- Post-harvest treatment (**optional**, based on the national legislation of the importing country).

- **E. Official control mark (optional)**



Conclusions

Referring to (Speaking about) oranges, there are a few but significant differences between Codex and UNECE standards, apart from those due to points 7.Contaminants and 8.Hygiene:

- Maturity requirements: sugar/acid ratio parameter.**
- Sizing: a new option for uniformity, establishing four ranges in size.**
- Quality tolerances: decay permitted in classes I and II.**
- Presentation: mixtures of citrus fruit species permitted, and fruits with short twigs and green leaves.**
- Marking: post-harvest treatment optional.**





**Thank you for
your attention.**

