

Product Description Language Oranges: Reference Guide

First Edition
April 1995

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- **PDL Oranges General Parameters**
- **PDL Oranges Defect Parameters**

ISBN Number:
0 7341 1203 3

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Published and distributed by:
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PRODUCT DESCRIPTION LANGUAGE ORANGES

What is a product description language?

A Product Description Language (PDL) is a set of terms and definitions used to describe a product. It focuses on the key quality attributes of a product and describes them in a way that is readily measured (preferably objectively). In this way a PDL can be used by producers, packers, processors, wholesalers, exporters and retail customers to identify what quality attributes are important to them. It also provides the opportunity to specify what style of blemish, size, shape, sweetness or other parameter is either available to supply or acceptable to purchase.

What is this Reference Guide?

Firstly, it is worth noting that the Export Control Order Schedule 13 is no longer enforceable.

Secondly, effective quality systems of the type that many citrus packers are now implementing, require the supplier to clearly understand what the customer wants, and be aware of your own ability to supply. To do this requires a language to describe the product so that the specifications are understood by all parties and are measurable.

This Reference Guide contains the terms and definition that specially relate to the quality of oranges. It is designed for use by growers, packers, marketers and buyers of oranges. It is not intended to replace any existing grades or standards including those designed by packers and marketers themselves. Rather, it is designed to enable existing grade specifications to be put into a language that will be adopted across the industry.

Fruit packed under this system can be labelled under any grad standards that may be required such as Codex Alimentarius or OECD agreements so long as the fruit meets these standards.

How to use this language

As discussed above, this language does not set new standards for oranges. It provides the means for describing oranges to whatever specification is agreed between supplier and customer. It may also be useful as the basis for providing packout information to growers. It will be important for packers and suppliers to sue quality management systems to ensure that the packed fruit complies with the required levels of quality parameters.

The Reference Guide sets out and defines the types of quality parameters applicable to oranges. It then suggests some options within each parameter. The options are at three levels and each level is termed a style. When packing fruit, packers are given the quality parameters of the fruit and the style and percentage of those parameters that will be present in the finished pack. When buyers order, they select the quality parameter types and styles and the percentages they require in the finished pack.

In simple terms this Product Description Language for Oranges does the following:

1. Specifies types of quality parameters.
2. Specifies the style of each quality parameter.
3. Provides some guidance and suggested documents for use of the language.

The attributes of the fruit being used in this system are termed product quality parameters. Many types of quality parameters can be defined such as colour, shape and blemish. There are also tother such as different physiological disorders and addition criteria such as weight of fruit in the carton.

In this Product Description Language the following quality parameters have been selected as the most important for oranges. These are defined below using terminology derived from internationally accepted standards. More quality parameters may be defined by the user if needed.

Quality parameters

- *Intact* means practically free from any mutilation or injury spoiling the orange.
- *Sound* means not overripe, soft or wilted, and free of rots, sunburn, excessive bruising or physical injuries, both external and internal, likely to affect the keeping quality of the orange.
- *Clean* means visibly free from any dirt, dust, chemical residue or other foreign matter.
- *Juicy* means a minimum juice content of at least 33%.
- *Shape* means the natural formation of the fruit, not as a result of deformation caused by packing and transport.
- *Colour* colour is the natural orange, yellow, red and green pigments of the fruit. In this case colour refers to the balance of orange and green colour in the fruit.
- *Regreening* the extent to which Valencia oranges regreen during the season.
- *Texture* texture is the surface appearance and feel of the fruit.
- *Skin Thickness* skin thickness refers to the width of the surface rind and the albedo under the rind.
- *Sweetness* refers to the magnitude of the soluble solids content of the fruit.
- *Light Blemish* means any light coloured superficial disfigurement of the skin that is not likely to affect the keeping quality of the orange, and includes slight chemical burns and healed injury such as insect damage, superficial hail damage, abrasions, scratches and wind damage.
- *Dark Blemish* superficial disfigurement of the skin similar to above, but the blemish is darker in colour.
- *Deep Blemish* superficial disfigurement of the skin similar to dark blemish, but the blemish is sunken below the skin surface.
- *Scale Blemish* superficial disfigurement of the skin similar to above but the blemish shows as small scales on the surface.

- *Stem End Blemish* superficial disfigurement of the skin similar to above, this show as a ring-shaped blemish on the stem end of the fruit.
- *Navel Deformation* is where a portion of the navel may protrude excessively beyond the normal shape of the fruit.
- *Corrugations* corrugations on fruit show as furrows radiating from the stem end.
- *Oleocellosis* oleocellosis is superficial injury showing as light yellow to brown coloured patches.
- *Albedo Breakdown (Creasing)* creasing shows are irregular formation of furrows on the rind.

More detailed definitions and photographs of the parameters are given in the following pages.

In this system the quality parameters detailed above are placed into three categories:

1. Basic quality parameters.
2. General quality parameters.
3. Defect quality parameters.

The system allows for any other parameter types or pack requirements such as labelling, count, size, weight, to be added with the agreement of buyer and seller.

Basic quality parameters

The Product Description Language in this Reference Guide refers to fruit primarily for the fresh fruit market. As such, the fruit will meet some basic quality parameters as accepted in the international market. These requirements have been derived from the Codex Alimentarius and OECD information. Four types are listed and others may be added if required. Because the basic quality parameters do not vary there are no styles associated with the types. No photographs for these are given.

All fruit described in this Product Description Language has the following attributes:

- Intact
- Sound
- Clean
- Juice

General quality parameters

These are parameters that all fruit must possess. Usually this means desirable specified characteristics in a line of fruit. Six types and three styles for each are given. Others may be added if required.

- Shape
- Colour
- Regreening
- Texture
- Skin thickness
- Sweetness

Defect quality parameters

These are parameters that may be regarded as undesirable. They are specified in the same way as general quality parameters by type and by style. A defect quality parameter means any blemish or superficial disfigurement of the skin, abnormal development of shape, colour, or condition that may detract from the required quality, general appearance or presentation of the orange. They also include symptoms caused by abnormal physiological conditions such as albedo breakdown (creasing) and oleocellosis, and conditions such as corrugations, misshape and navel deformation. Nine types, each with three styles are given.

Studies have shown that there is no such thing as a 'perfect' fruit. All oranges have a single or a combination of defect quality parameters on each fruit. Product Description Language includes all defect quality parameters in the assessment.

- Light blemish
- Dark blemish
- Deep blemish
- Scale blemish
- Stem end blemish
- Navel deformation
- Corrugations
- Oleocellosis
- Albedo breakdown (creasing)

Putting the procedures in place

This Product Description Language depends on objective assessment of the fruit. It will only work effectively in a quality management system that ensures the correct procedures for sampling and recording.

The procedures for carrying out the analysis of the fruit and using the specifications in the marketplace are given at the end of the Reference Guide.

For packers with electronic weight and/or colour sorting, the opportunity exists to set your own specifications according to the means of measurement utilised by your equipment. There should be no difficulty in using this language to describe your specifications.

Packers should be aware that there are other aspects to a customer's specification for oranges. Issues that need to be taken into account include:

- Waxing
- Package type
- Package markings
- Pallet dimensions
- Strapping
- Corner pieces
- Time and mode of delivery
- Temperature management

In addition to this Reference Guide, a set of colour plates of each individual style has been produced. The purpose of this additional resource is to assist packing house staff on a day-to-day basis by indicating the allowable styles for a particular order. Sets of the colour plates are available from Horticulture Australia Limited (HAL).

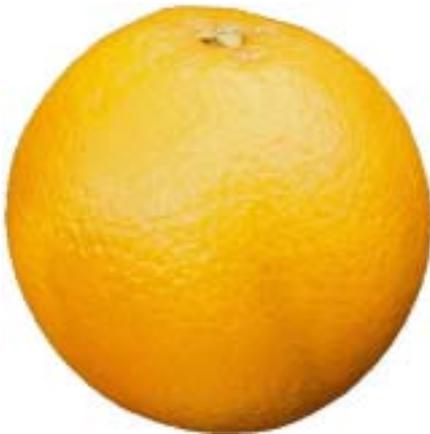
Further information on implementing quality management systems is available from BB Beattie and LJ Relevant (Eds) (1992) Guide to *Quality Management in the Citrus Industry*, HAL, Sydney, for information on implementing quality management systems.

GENERAL QUALITY PARAMETERS

Shape

Shape means the natural formation of the fruit, not as a result of deformation caused by packing and transport. Oranges will be generally well formed and conform with what is accepted as shape according to the variety. The general shape may vary from the normal by being elongated, flat and showing a prominent neck. Internal fruit and eating quality is not affected by shape.

Style



A

Generally well shaped and round according to variety.



B

Medium degree of misshape. This photograph is only an example of medium misshape, it does not only apply to the elongated fruit shown here. Other shapes in this B medium category may be flat or necked.

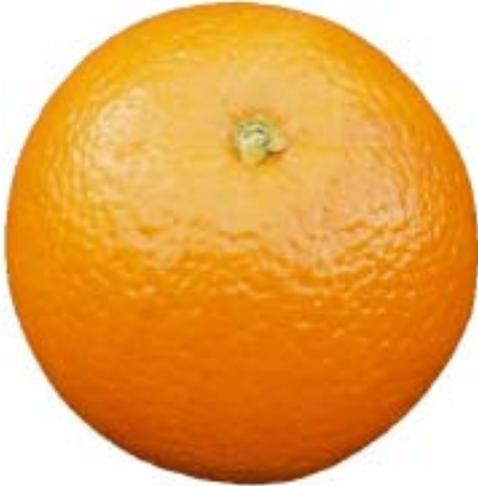


C

Severe misshape. This photograph is only an example of severe misshape, it does not only apply to the necked shape shown here. Other shape in this C category may be flat, or elongated.

Colour

Colour is the combination of the natural orange, yellow, red and green pigments in the skin of the fruit. Colour in this Guide refers to the balance of orange and green colour in the skin of the fruit. Green fruit early in the navel season may indicate immature fruit.

Style**A**

Fruit surface full orange colour.

**B**

Up to one quarter of the fruit surface even green colour.

**C**

Up to three quarters of the fruit surface even green colour.

Regreening

Valencia oranges may regreen during the season. This quality parameter is defined as the ratio of orange and green colour of the skin of the fruit.

Style



A

Up to one quarter of the fruit surface green colour.



B

Up to one half of the fruit surface green colour.



C

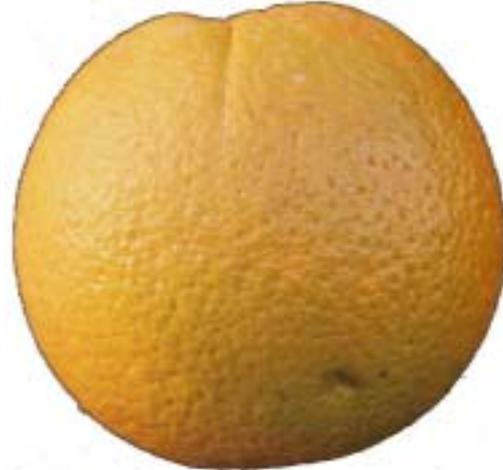
Most of the fruit surface green colour.

Texture

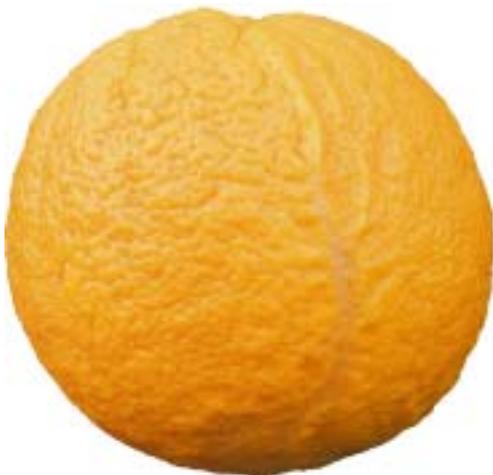
Texture is the surface appearance and feel of the fruit. Fruit will vary in texture depending on time of harvest and location of orchard. Internal fruit quality is not affected.

Style**A**

The photograph shows an orange with texture Style A.

**B**

The photograph shows an orange with texture Style B.

**C**

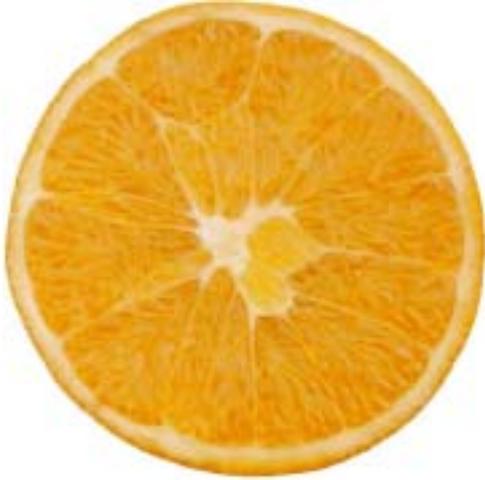
The photograph shows an orange with texture Style C.

Texture is subjectively measured by feeling the fruit and looking at the surface for the degree of indentations.

Skin Thickness

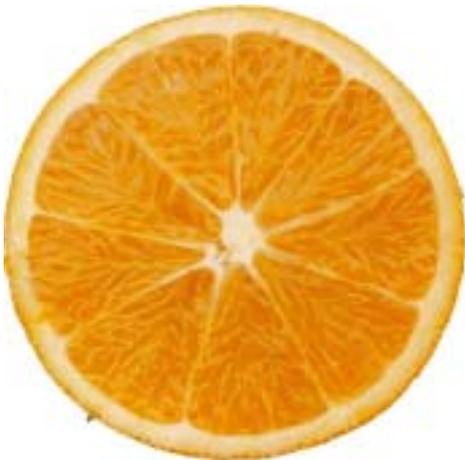
Skin thickness refers to the width of the surface rind plus the albedo under the rind. Skin thickness is influenced by a number of factors. Internal fruit quality is not affected.

Style



A

Style A skin is thickness up to 3 mm.



B

Style B skin thickness up to 5 mm.



C

Style C skin thickness up to 7 mm.



Sweetness

Sweetness refers to the magnitude of the soluble solids content of the fruit. There is a standard procedure for measuring sweetness (see *Guide to Quality Management in the Citrus Industry*).

		Style
Soluble solids content	>11° Brix at 20°C	A
Soluble solids content	9.1 – 11° Brix at 20°C	B
Soluble solids content	7 – 9° Brix at 20°C	C

Other parameters

The Product Description Language leaves it open for other parameters to be defined if desired by the buyer and seller.

DEFECT QUALITY PARAMETERS

Light Blemish

Light blemish is usually inherent in the formation of the fruit and is caused by movement of the fruit by the wind and the rubbing of fruit against each other or against twigs or leaves. This injury shows as silver scurfs and russets and slight healed blemishes. The colour of the blemish is light and may range from silver, grey or cream but not dark such as brown or black. Three styles of light blemish are presented. The internal quality and taste of the fruit is not affected by external superficial blemish.



Style

A

The photograph depicts light blemish on the surface of the orange. The total area of light blemish on the orange for this style is up to:

1 sq cm



B

The photograph depicts light blemish on the surface of the orange. The total area of light blemish on the orange for this style is up to:

3 sq cm



C

The photograph depicts light blemish on the surface of the orange. The total area of light blemish on the orange for this style is up to:

6 sq cm



Dark Blemish

Dark blemish is usually caused by the same conditions as light blemish. The major difference is that it is more prominent because of its dark colour. The shape may be irregular and the blemish may appear on a number of places on the orange. The internal quality and taste of the fruit is not affected.

Style



A

The photograph depicts dark blemish on the surface of the orange. The total area of dark blemish on the orange for this style is up to:

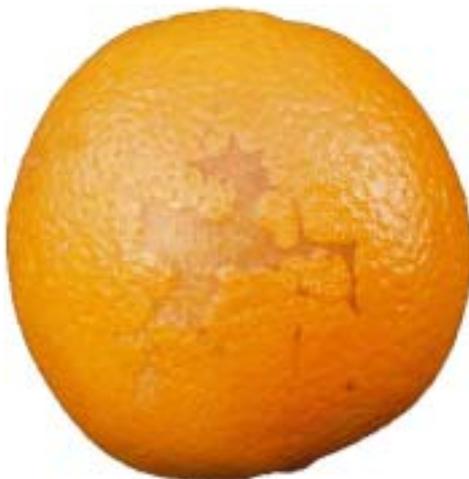
1 sq cm



B

The photograph depicts dark blemish on the surface of the orange. The total area of light blemish on the orange for this style is up to:

3 sq cm



C

The photograph depicts dark blemish on the surface of the orange. The total area of light blemish on the orange for this style is up to:

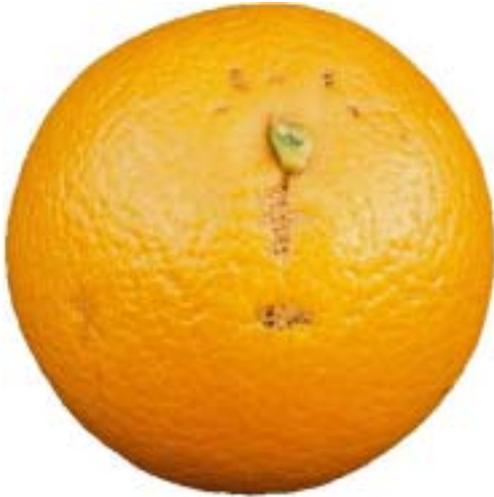
6 sq cm



Deep Blemish

Deep blemish is usually caused by insects such as katydids. The lesion is a slightly depressed, rounded and irregular healed scar of a mottled grey, black appearance. The internal quality and taste of the fruit is not affected.

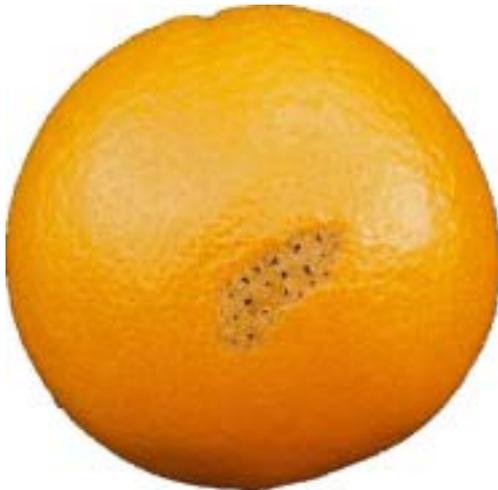
Style



A

The photograph depicts deep blemish on the surface of the orange. The total area of dark blemish on the orange for this style is up to:

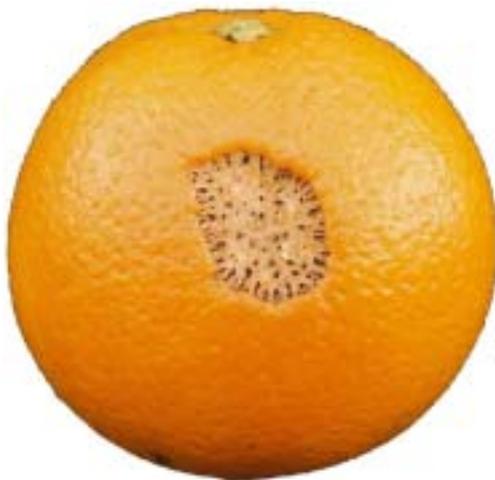
1 sq cm



B

The photograph depicts deep blemish on the surface of the orange. The total area of light blemish on the orange for this style is up to:

3 sq cm



C

The photograph depicts deep blemish on the surface of the orange. The total area of light blemish on the orange for this style is up to:

6 sq cm



Scale Blemish

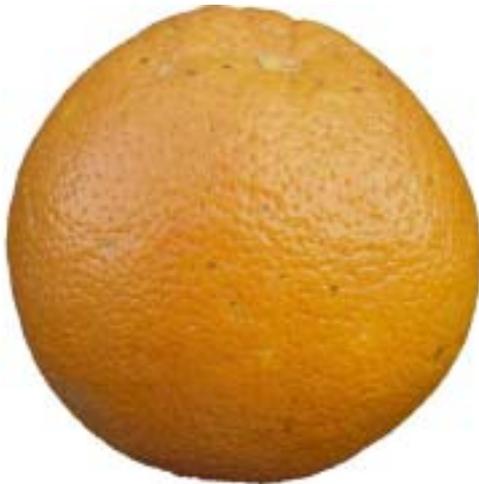
Scale blemish is a common defect in oranges. The blemish is the remains of the insect on the surface of fruit. The internal quality and taste of the fruit is not affected.

Style



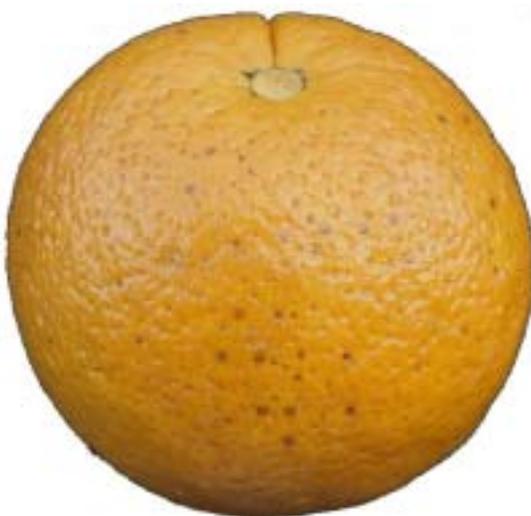
A

The photograph depicts scale blemish on the surface of the orange for Style A.



B

The photograph depicts scale blemish on the surface of the orange for Style B.

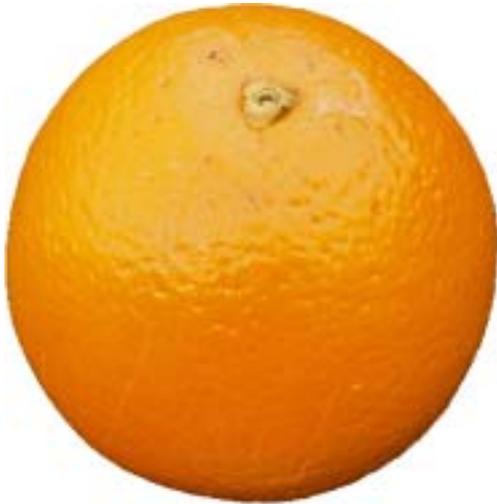


C

The photograph depicts scale blemish on the surface of the orange for Style C.

Stem End Blemish

Stem end blemish is a common defect in oranges. The damage is usually caused by insects such as light brown apple moth (LBAM) or thrips feeding on the fruit and producing a blemish similar to wind rub. This shows as a ring-shaped blemish on the stem end of the fruit. The internal quality and taste of the fruit is not affected.

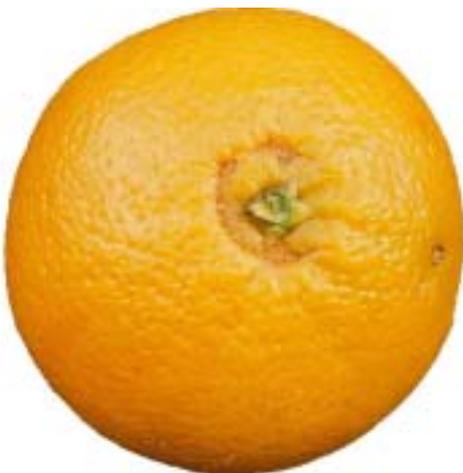


Style

A

The photograph depicts stem end blemish on the surface of the orange. The total area of stem end blemish on the orange for this style is up to:

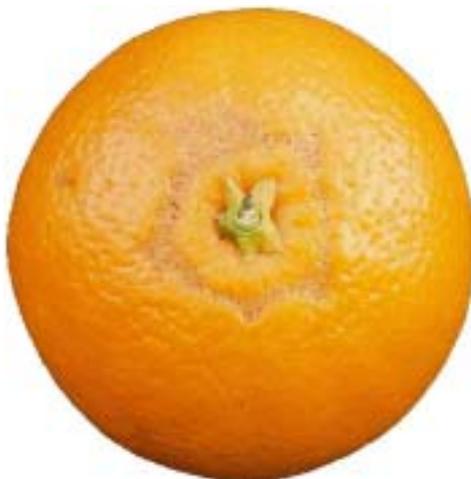
1 sq cm



B

The photograph depicts stem end blemish on the surface of the orange. The total area of stem end blemish on the orange for this style is up to:

3 sq cm



C

The photograph depicts stem end blemish on the surface of the orange. The total area of stem end blemish on the orange for this style is up to:

6 sq cm



Navel Deformation

Occasionally navel oranges suffer from degrees of deformation of the navel. A portion of the navel may protrude excessively beyond the normal shape of the fruit. There may be a number of folds in the navel and some green discoloration. The internal quality and taste of the fruit is not affected.

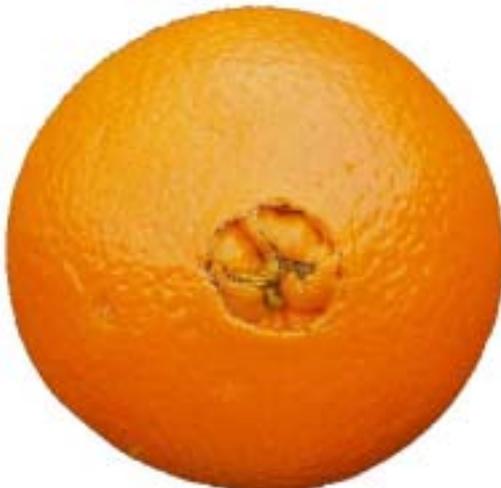


Style

A

The photograph depicts navel deformation at the navel end of the orange. The total area of navel deformation on the orange for this style is up to:

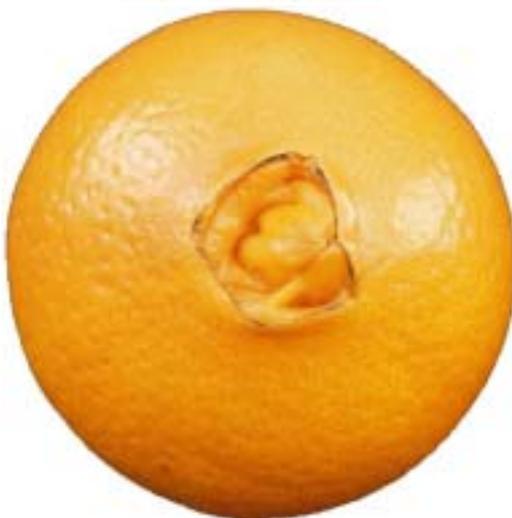
1 sq cm



B

The photograph depicts navel deformation at the navel end of the orange. The total area of navel deformation on the orange for this style is up to:

3 sq cm



C

The photograph depicts navel deformation at the navel end of the orange. The total area of navel deformation on the orange for this style is up to:

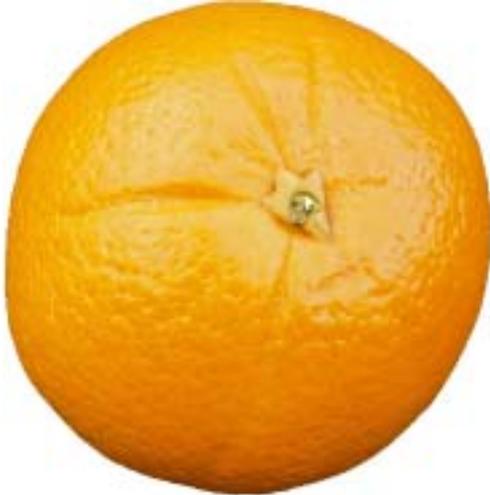
6 sq cm



Corrugations

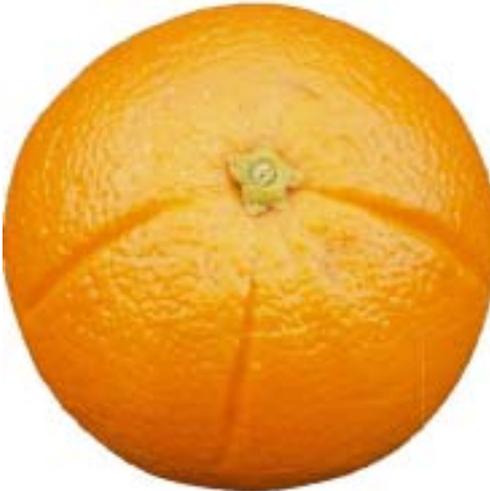
Corrugations are an exterior visual quality defect which is found occasionally on oranges. These fruits have furrows radiating from the stem end. These corrugations are not weak spots and will not spilt open during marketing. Internal fruit quality is not affected.

Style



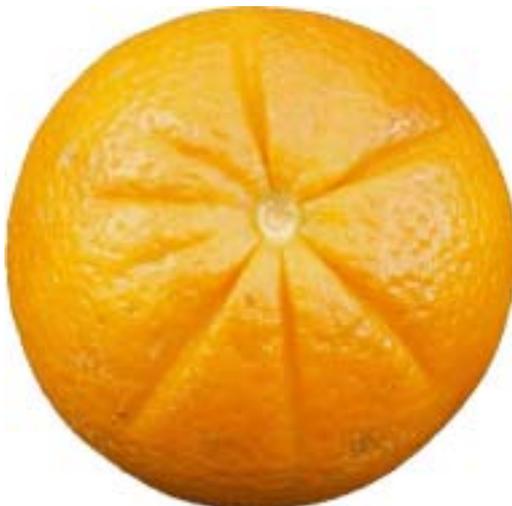
A

The photograph depicts corrugations on the surface of the orange for Style A.



B

The photograph depicts corrugations on the surface of the orange for Style B.



C

The photograph depicts corrugations on the surface of the orange for Style C.

Oleocellosis

Oleocellosis is caused by damage to the rind tissue by oil released from damaged oil glands. Damaged tissue changes colour one or two days after release of rind oil. Superficial injury results in light yellow coloured patches. Severe injury results in darker brown patches and rind collapse. The remaining oil glands become conspicuous. The internal fruit quality and taste are not affected.

Style



A

The photograph depicts oleocellosis of the orange. The total area of oleocellosis on the orange for this style is up to:

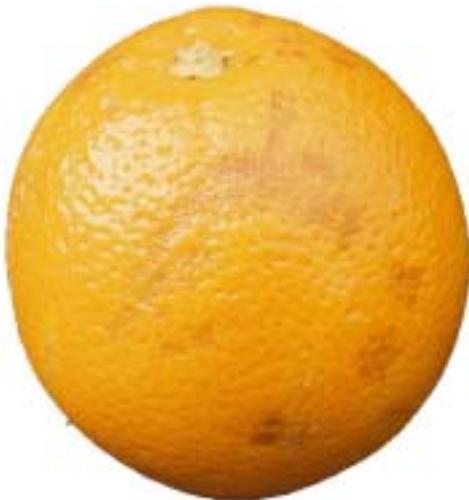
1 sq cm



B

The photograph depicts oleocellosis of the orange. The total area of oleocellosis on the orange for this style is up to:

3 sq cm



C

The photograph depicts oleocellosis of the orange. The total area of oleocellosis on the orange for this style is up to:

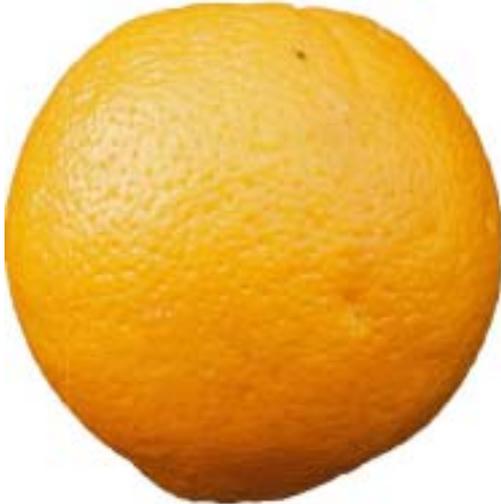
6 sq cm



Albedo Breakdown (creasing)

Creasing is the collapse of the underlying albedo, producing varying degrees of wrinkled appearance of the fruit rind. The exact cause is unknown. The defect shows as irregular formation of furrows on the rind where the albedo has broken down and the flavedo has swollen. The interior portion of the fruit is not affected.

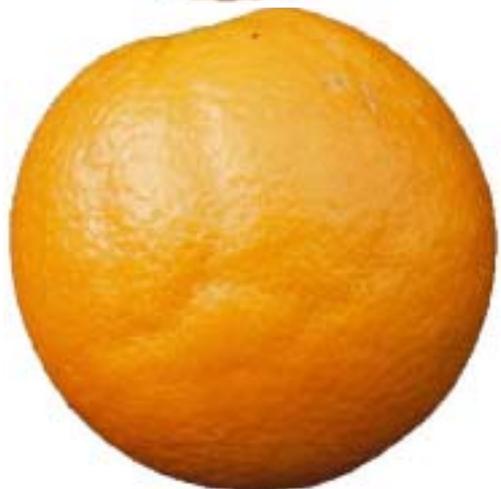
Style



A

The photograph depicts creasing of the orange. The total area of creasing on the orange for this style is up to:

1 sq cm



B

The photograph depicts creasing of the orange. The total area of creasing on the orange for this style is up to:

3 sq cm



C

The photograph depicts creasing of the orange. The total area of creasing on the orange for this style is up to:

6 sq cm



PROCEDURES FOR USING THE SYSTEM

There are two documents recommended for use with the system.

1. PACKINGHOUSE ANALYSIS SHEET
2. MARKET SPECIFICATIONS FORM

The PACKINGHOUSE ANALYSIS SHEET is used in the packinghouse to monitor and analyse the fruit being prepared for market. The MARKET SPECIFICATIONS FORM is used by sellers and buyers to describe the product.

Packinghouse Analysis Sheet Procedure

Product Description Language depends on objective sampling of the fruit. It will only work effectively in a quality management system that ensures correct procedures. The following are the recommendations for sampling procedures.

Make a subjective inspection of the fruit as soon as practical after it arrives at the packinghouse. An objective assessment (using the 'Packinghouse Analysis Sheet') should be made of fruit taken from the packing line before it is packed, and an objective assessment ('Packinghouse Analysis Sheet') should be carried out on packed cartons after packing. Samples should be representative of the line of fruit.

1. Take a sample of 100 fruit from the line immediately after the sorting station. Take the sample at the start of packing for the session. Take further samples as required such as after a change of growers or orchard block or after an elapsed time such as 30 minutes.
2. Write down the percentage of the required styles in the appropriate box on the 'Packinghouse Analysis Sheet'. Examine each fruit individually for each quality parameter type and style. Remember, each fruit may have a number of defects and all should be counted. Record each fruit's attributes in the appropriate box by using a system such as dots or crosses. After each fruit has been assessed, count the number, calculate the % and write this in the percentage box. Compare this percentage with what is required and adjust the sorting process if necessary.
3. Take a sample carton after packing and go through the same procedure. Assess sample cartons at about one every two pallets, or according to requirements.
4. Transfer the information to the 'Market Specification Form'.

Information from the 'Packinghouse Analysis Sheet' should be used to advise the sorters to modify their sorting if the analysis shows the fruit does not conform with the product specifications required.

Examine the 'Packinghouse Analysis Sheet' closely over time to build up a profile of the fruit. The trends in quality parameters can then be established for a packinghouse and linked to market requirements. It is expected that a packinghouse will develop a range of combinations of quality parameters and styles that will become their market benchmarks.

Market Specifications Form Procedure

For the buyer

1. Assume the Basic Quality Parameters are required. If not, write in what is wanted.
2. Select each General Quality Parameter type required and specify the percentage required of each style (A, B, C) for that quality parameter type. Write in the percentage in the appropriate box. If it does not matter what style is required, tick the 'any style' box for that quality parameter type.
3. Select each Defect Quality Parameter type required and specify the percentage required of each style (A, B, C). Write in the percentage in the appropriate box. If it does not matter what style is required, tick the 'any style' box for that quality parameter type. If any quality parameter type is not required at all, cross it out.

For the packer

Use the information from the 'Packinghouse Analysis Sheets' to write in the 'Market Specifications Form' what is available. The information can also be used to deliver feedback to grower suppliers.

PACKINGHOUSE ANALYSIS SHEET

DATE	TIME		IDENTIFICATION		COUNT	
QUALITY PARAMETERS	STYLE A		STYLE B		STYLE C	
	REQUIRED %	ACTUAL %	REQUIRED %	ACTUAL %	REQUIRED %	ACTUAL %
Shape						
		%		%		%
Colour						
		%		%		%
Regreening						
		%		%		%
Skin thickness						
		%		%		%
Sweetness						
		%		%		%
Texture						
		%		%		%
Light blemish						
		%		%		%
Dark blemish						
		%		%		%
Deep blemish						
		%		%		%
Scale blemish						
		%		%		%
Stem end blemish						
		%		%		%
Navel deformation						
		%		%		%
Corrugations						
		%		%		%
Oleocellosis						
		%		%		%
Albedo breakdown (creasing)						
		%		%		%
Other						
		%		%		%
TOTAL / SUMMARY						

MARKET SPECIFICATIONS FORM

BASIC QUALITY PARAMETERS	All fruit will be: intact, sound, clean and juicy			
QUALITY PARAMETERS	Style			
GENERAL PARAMETERS	A	B	C	ANY STYLE
TYPE	Write in percentage or tick for 100%	Write in percentage or tick for 100%	Write in percentage or tick for 100%	Tick if style does not matter
Shape				
Colour				
Regreening				
Texture				
Skin thickness				
Sweetness				
Other				
DEFECT PARAMETERS				
Cross out defect type if it is not wanted in any style				
Light blemish				
Dark blemish				
Deep blemish				
Scale blemish				
Stem end blemish				
Navel deformation				
Corrugations				
Oleocellosis				
Albedo breakdown (creasing)				
Other				